AVD-K150B/K150E/K150G/ K150N/K150R

SERVICE MANUAL

Ver 1.0 2004.06

AEP Model

AVD-K150B/K150E/K150N/K150R

UK Model

AVD-K150G

AVD-K150B/K150E/K150G/K150N/K150R is the Amplifier, DVD/VIDEO player and tuner section in DAV-D150B/D150E/D150G/D150N/D150R.

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DVD	Model Name Using Similar Mechanism	NEW
	Mechanism Type	DP-7C
	Optical Pick-up Name	PVR-502W
VCR	Mechanism Type	D35 (N)

SPECIFICATIONS

General

Power requirements	AC 230 V , 50/60 Hz
Power consumption	74W
Dimensions (approx.)	430 x 98 x 386 mm (17 x 3 7/8 x 15 1/4 inches) (W x H x D)
Mass (approx.)	6.5 kg (14 lb 6 oz)
Operating temperature	5 °C to 35 °C (41 °F to 95 °F)
Operating humidity	5 % to 90 %

DVD Section

Laser	Semiconductor laser (Wavelength DVD: 650nm, CD: 780nm)
Signal system	PAL
Frequency response	DVD (PCM 48 kHz): 10 Hz to 22 kHz CD: 10 Hz to 20 kHz
Signal-to-noise ratio	More than 80 dB (ANALOG OUT connectors only)
Harmonic distortion	Less than 0.05%

VIDEO Section

Head system	4 heads helical scan azimuth system
Television system	PAL B/G colour system (150E) PAL B/G, SECAM L colour system (150B) PAL I colour system (150G) PAL B/G, SECAM D/K colour system (150N) PAL (B/G, I/I), SECAM D/K colour system (150R)
Recording format	PAL
Tape speed	PAL/MESECAM; 23.39 mm/s (SP), 16.69 mm/s (LP)
Maximum recording time	SP: 4 hour (E-240 tape), LP: 8 hour (E-240 tape)
Rewind time	About 180 seconds (E-180 tape)
Input level	VIDEO: 1.0 V(p-p), 75 ohms, unbalanced AUDIO: -6.0 dBm, more than 10 kohms (SCART) -6.0 dBm, more than 47 kohms (RCA) DIGITAL AUDIO IN: Optical connector x 1
Output level	VIDEO: 1.0 V(p-p), 75 ohms, unbalanced

FM Tuner

Tuning Range	65 - 74 MHz (150R) 87.5 - 108.0 MHz (ALL MODEL)
Intermediate Frequency	10.7 MHz

AM Tuner

Tuning Range	522 - 1,611 kHz
Intermediate Frequency	450 kHz

Amplifier Section

Stereo mode	70W + 70W (6 Ω at 1 kHz, THD 10 %)
Surround mode	Front: 70W/ch (6 Ω at 1 kHz, THD 10 %) Center*: 70W (6 Ω at 1 kHz, THD 10 %) Surround*: 70W/ch (6 Ω at 1 kHz, THD 10 %) Subwoofer*: 100W (4 Ω at 30 Hz, THD 10 %)
	* Depending on the sound mode settings and the source, there may be no sound output.
Inputs	AV 2, AV 3, OPTICAL IN (AV3 OPT)

• Design and specifications are subject to change without notice.

DVD/VCR RECEIVER

9-877-959-01
2004F1678-1

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Sony Corporation
Home Audio Company
Published by Sony Engineering Corporation

SONY

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

UNLEADED SOLDER

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40 °C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350 °C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscou-s (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

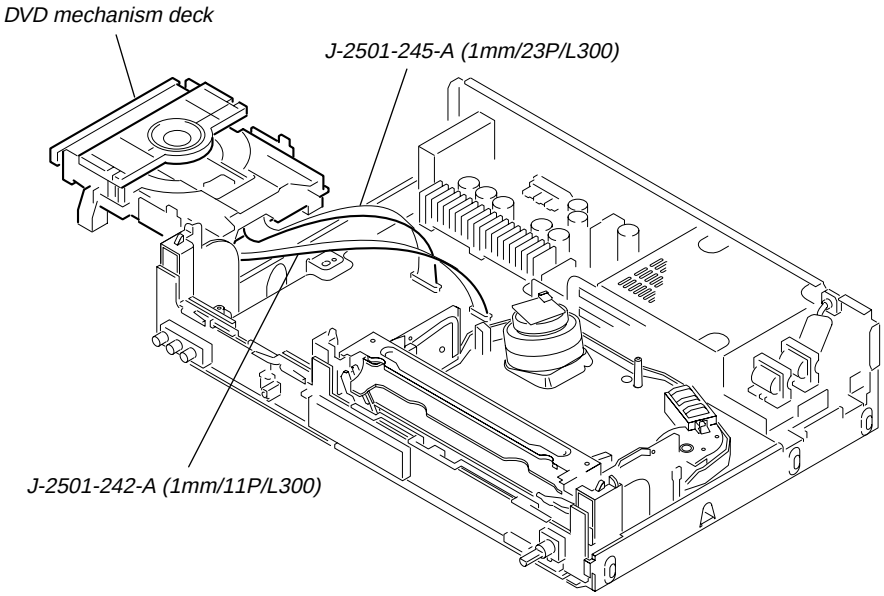
NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

LASER DIODE AND FOCUS SEARCH OPERATION CHECK

Carry out the “S curve check” in “CD section adjustment” and check that the S curve waveform is output several times.

• **SERVICE POSITION-1 (DVD Mechanism Deck)**
Extension cable (J-2501-242-A, J-2501-245-A) is required to inspect the DVD mechanism deck.



• **SERVICE POSITION-2 (VIDEO Mechanism Deck)**
Perform the operation check of the VIDEO mechanism deck after the VCR board and the VIDEO mechanism deck are turned upside down.

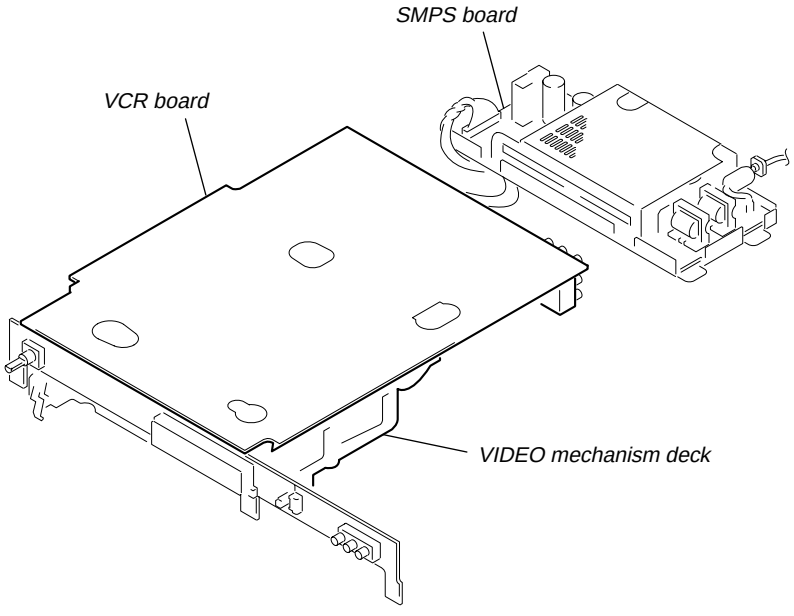


TABLE OF CONTENTS

1. GENERAL 5

2. DISASSEMBLY

2-1. Cover, Front Panel Assembly 12
2-2. DISPLAY/KEY Board 13
2-3. Video Mechanism Deck 13
2-4. DVD Mechanism Deck 14
2-5. SMPS Board 14
2-6. VCR Board 15
2-7. DVD & AMP Board 15

3. ELECTRICAL ADJUSTMENTS

3-1. VCR Section Electrical Adjustment 16
3-2. Electrical Troubleshooting Guide 17
3-3. DVD & AMP Section Electrical Troubleshooting Guide 32

4. MECHANICAL ADJUSTMENTS 40

5. DIAGRAMS

5-1. Block Diagram – DVD (OVERALL) Section – 52
5-2. Block Diagram – DVD (AMP) Section – 53
5-3. Block Diagram – VCR/PANEL Section – 54
5-4. Block Diagram – VCR (Y/C) Section – 55
5-5. Block Diagram – VCR (TU-VPS) Section – 56
5-6. Block Diagram – VCR (HI-FI) Section – 57
5-7. Block Diagram – VCR POWER Section – 58
5-8. Block Diagram – POWER Section – 59
5-9. Printed Wiring Board – DVD & AMP Section (Component Side) – 60
5-10. Printed Wiring Board – DVD & AMP Section (Conductor Side) – 61
5-11. Schematic Diagram – MPEG Section – [DVD & AMP Board] (1/6) 62
5-12. Schematic Diagram – RF & SERVO Section – [DVD & AMP Board] (2/6) 63
5-13. Schematic Diagram – AUDIO, µ_COM Section – [DVD & AMP Board] (3/6) 64
5-14. Schematic Diagram – DIGITAL AMP Section – [DVD & AMP Board] (4/6) 65
5-15. Schematic Diagram – PWM & CODEIC Section – [DVD & AMP Board] (5/6) 66
5-16. Schematic Diagram – INTERFACE Section – [DVD & AMP Board] (6/6) 67
5-17. Printed Wiring Board – VCR Section – 70
5-18. Schematic Diagram – VCR SYSTEM Section – [VCR Board] (1/6) 71
5-19. Schematic Diagram – AVCP/SECAM Section – [VCR Board] (2/6) 72
5-20. Schematic Diagram – HI-FI/SWITCH Section– [VCR Board] (3/6) 73
5-21. Schematic Diagram – TUIF/NICAM/VPS Section – [VCR Board] (4/6) 74
5-22. Schematic Diagram – SCART/SWITCH Section– [VCR Board] (5/6) 75
5-23. Schematic Diagram – VCR POWER Section – [VCR Board] (6/6) 76
5-24. Printed Wiring Board – DISPLAY/KEY Section – 78
5-25. Schematic Diagram – DISPLAY/KEY Section – 79
5-26. Printed Wiring Board – SMPS Section – 80
5-27. Schematic Diagram – SMPS Section – 81

6. EXPLODED VIEWS

6-1. Front Panel Section 83
6-2. Overall Section 84
6-3. DVD Mechanism Deck 85
6-4. Video Mechanism Deck -1 86
6-5. Video Mechanism Deck -2 87
6-6. Video Mechanism Deck -3 88

7. ELECTRICAL PARTS LIST 89

This section is extracted from instruction manual.

Front Panel

I / ⏻
Switches the DVD/VCR Receiver ON and OFF.

⏏ VIDEO
Ejects the tape in the VIDEO deck.

AV 3 IN (VIDEO/AUDIO (Left/Right))
Connect the audio/video output of an external source (Audio system, TV/ Monitor, another VCR).

VOLUME
Adjusts sound level of speakers.

■ (STOP)
Stops playback or recording.

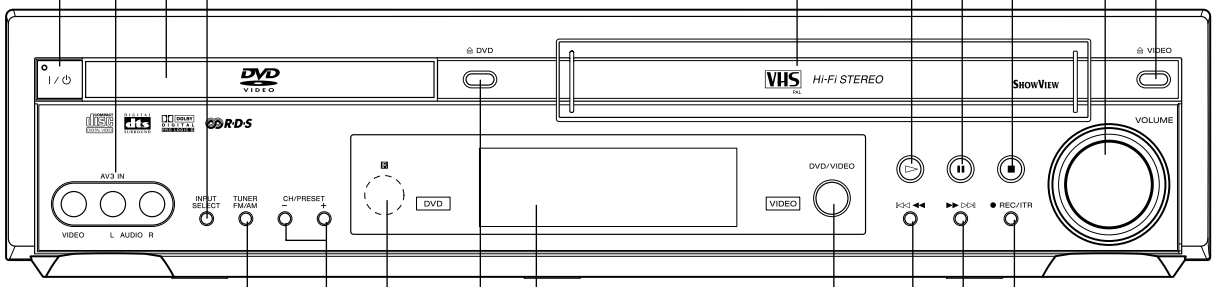
Disc Tray (DVD deck)
Insert a disc here.

II (PAUSE)
Pause playback or recording temporarily.

INPUT SELECT
Selects the VIDEO deck's source (Tuner, AV1, AV2, AV3 OPT or AV3).

▷ (PLAY)
To play back a disc or a recorded tape.

Video Cassette Compartment (VIDEO deck)
Insert a video cassette here.



TUNER FM/AM
Selects Radio operation mode.

Display window
Shows the current status of the DVD/VCR Receiver.

CH/PRESET (+/-)
Scans up or down through memorized channels or radio frequencies (stations).

⏏ DVD
Opens or closes the disc tray.

DVD/VIDEO
Toggles control between the DVD deck and the VIDEO deck.

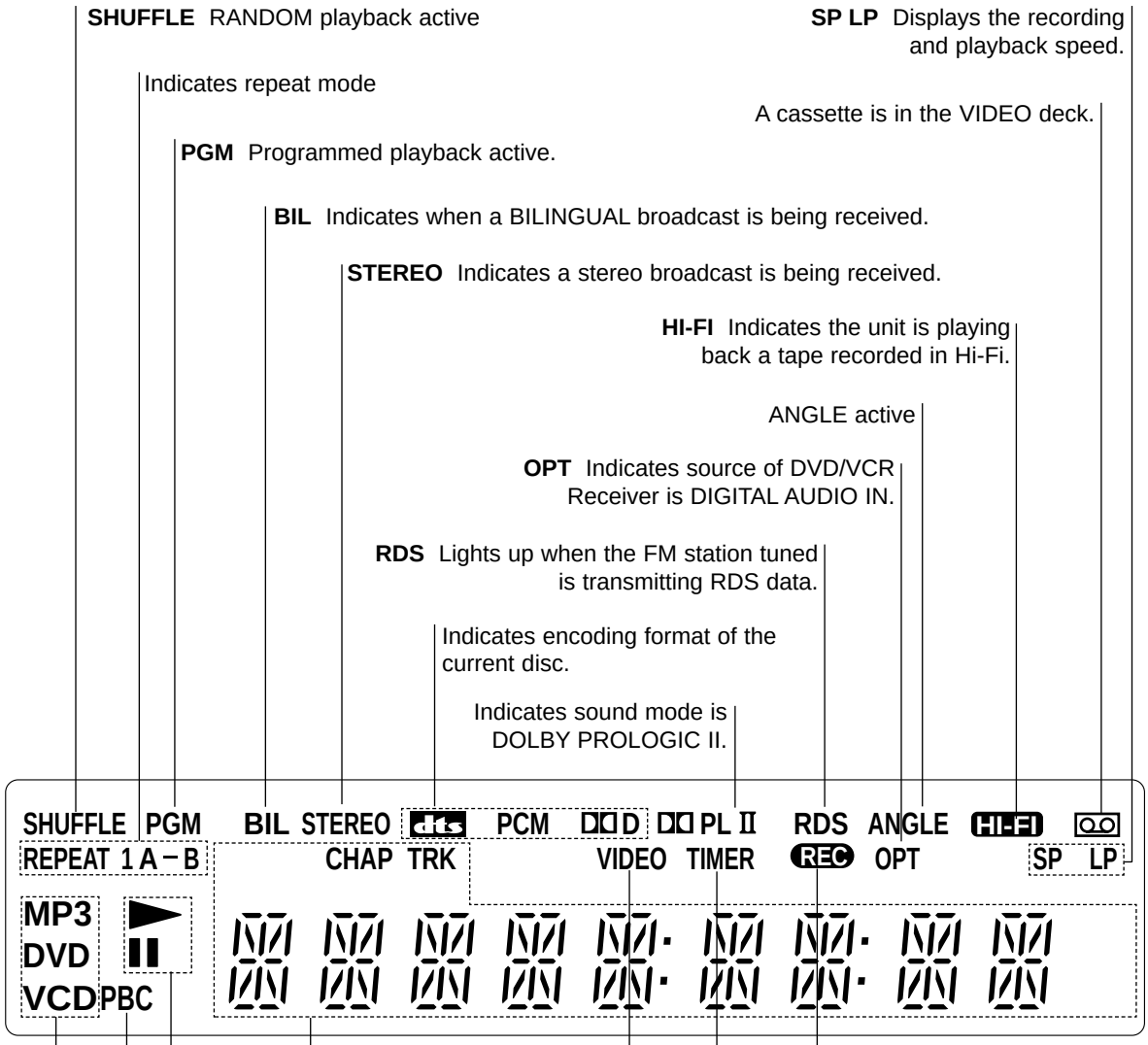
Remote Sensor
Point the DVD/VCR Receiver remote control here.

⏮ ◀◀
DVD: Go to beginning of current chapter/track or to previous chapter/track. Press and hold for a fast reverse search.
VIDEO: Rewinds the tape from STOP mode or for fast reverse picture search.

▶▶ ▷▷⏭
DVD: Go to NEXT chapter/track. Press and hold for a fast forward search.
VIDEO: Advances the tape from STOP mode or for fast forward picture search.

● REC/ITR
To record normally or to activate Instant Timer Recording.

Display Window


SHUFFLE RANDOM playback active
SP LP Displays the recording and playback speed.
Indicates repeat mode
A cassette is in the VIDEO deck.
PGM Programmed playback active.
BIL Indicates when a BILINGUAL broadcast is being received.
STEREO Indicates a stereo broadcast is being received.
HI-FI Indicates the unit is playing back a tape recorded in Hi-Fi.
ANGLE active
OPT Indicates source of DVD/VCR Receiver is DIGITAL AUDIO IN.
RDS Lights up when the FM station tuned is transmitting RDS data.
Indicates encoding format of the current disc.
Indicates sound mode is DOLBY PROLOGIC II.
SHUFFLE PGM BIL STEREO dts PCM DD D PL II RDS ANGLE HI-FI
REPEAT 1 A – B CHAP TRK VIDEO TIMER REC OPT SP LP
MP3
DVD
VCD PBC
REC DVD/VCR Receiver is Recording.
TIMER DVD/VCR Receiver is in timer recording or a timer recording is programmed.
VIDEO DVD/VCR Receiver functions are available and channels are selected at DVD/VCR Receiver.
Indicates clock, total playing time, elapsed time, chapter number, track number, channel, radio frequency, volume, channel or current deck status (Playback, Pause, etc).
Indicates playback or pause mode.
PBC Indicates PBC On mode
DVD DVD inserted.
CD Audio CD inserted.
VCD Video CD inserted
MP3 MP3 disc inserted

Remote Control

VIDEO
Select the output source to VIDEO.

DVD
Sets the output source to DVD.

INPUT SELECT
Selects the VIDEO deck's source (AV1, AV2, AV3 OPT, AV3, or Tuner).

TUNER FM/AM
Selects the DVD/VCR Receiver's tuner as the listening choice. (FM and AM bands)

0-9 numerical buttons
Selects numbered options in a menu.

TUNING (+/-)
To tune in the desired station.

MEMORY
Memorize a radio station frequency into the tuner.

RDS
Start a search for a specific PS type.

SHUFFLE
Plays tracks in random order.

PROGRAM
Enters to the program edit mode or exits from that.

● REC/ITR
Records normally or activates Instant Timer Recording.

TV/VIDEO
To view channels selected by the VIDEO tuner or by the TV tuner.

SP/LP
Selects recording speed.

CM SKIP
Fast forwards picture search through 30 seconds of recording.

SHOWVIEW
To display the programme menu for SHOWVIEW System programming.

DVD TOP MENU
Displays the disc's Title menu, if available.

DVD MENU
Accesses menu on a DVD disc.

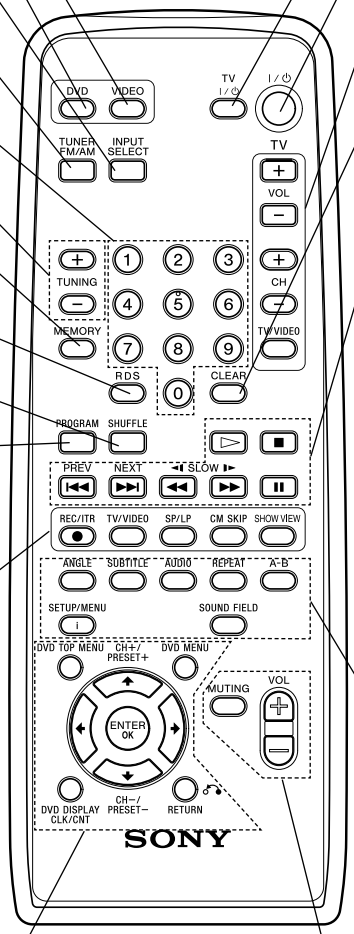
←/→/↑/↓ (left/right/up/down)
Selects an option in the menu.

CH/PRESET(+/-): Selects a program of VIDEO or Tuner. Adjusts manually the tape's picture onscreen.

ENTER/OK
Acknowledges menu selection.

DVD DISPLAY, CLK/CNT
Accesses On-Screen display. Switches among the clock and tape counter.

RETURN
Returns the setup menu.



TV I / ⏻
Switches TV ON and OFF.

I / ⏻
Switches DVD/VCR Receiver ON and OFF.

TV Control Buttons (see page 41)
- **VOL +/- :** Adjusts TV's volume.
- **CH +/- :** Selects TV's channel.
- **TV/VIDEO:** Selects the TV's source.

CLEAR
Removes a track number on the program menu. To clear preset stations from the tuner memory.

Playback Control Buttons
- **▷ (PLAY)**
  Starts playback.
- **■ (STOP)**
  Stops playback.
- **I◀◀ (PREV) (DVD mode only)**
  Go to beginning of current chapter or track or go to previous chapter or track.
- **▶▶I (NEXT) (DVD mode only)**
  Go to next chapter or track.
- **◀◀/▶▶ (SLOW ◀I/I▶)**
  DVD: For picture search or slow playback backward or forward.
  VIDEO: Rewinds or advances the tape in STOP mode or for picture search.
- **II (PAUSE)**
  zPause playback or recording temporarily.

ANGLE
Selects a DVD camera angle if available.

SUBTITLE
Selects a subtitle language.

AUDIO
Selects an audio language (DVD) or an audio channel (CD).

REPEAT
Repeat chapter, track, title, all.

A-B
Repeats sequence.

SETUP/MENU (i)
Accesses or returns DVD setup menu and VIDEO setup menu.

SOUND FIELD
Selects sound mode between BYPASS, PRO LOGIC, PRO LOGIC II (MOVIE, MUSIC, MATRIX) and 3D SURROUND.

VOL (+/-)
Adjusts speaker volume.

MUTING
Momentarily silence the speaker of the DVD/VCR Receiver.

Note
This remote control uses the same buttons for VIDEO and DVD functions (ex. PLAY).
To use the VIDEO, first press the VIDEO button.
To use the DVD, first press the DVD button.

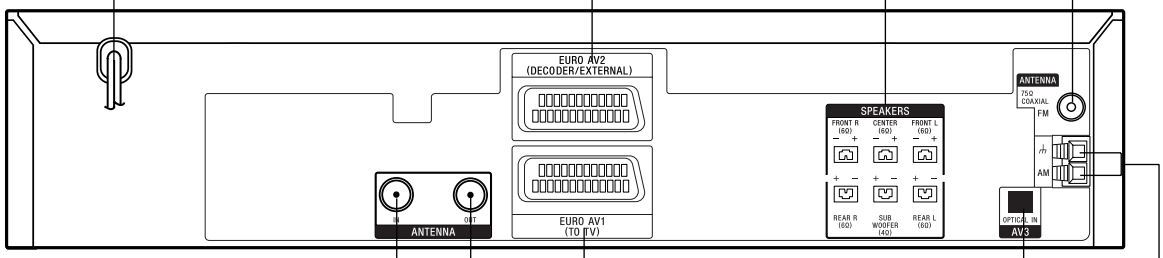
Rear Panel

FM ANTENNA Connectors
Connect the FM antenna to this terminal.

SPEAKERS Connectors
Connect the six supplied speakers to these terminals.

EURO AV2 DECODER/EXTERNAL (VIDEO IN)
Connect to Pay-TV decoder, Set Top Box or another video recorder.

AC Power Cord
Plug into the power source.



ANTENNA IN
Connect the VHF/UHF/CATV antenna to this terminal.

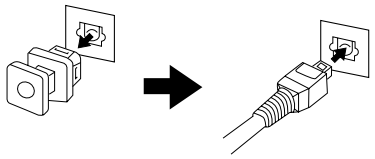
ANTENNA OUT (DVD/VIDEO OUT)
Connect to a TV with RF coaxial inputs.

EURO AV1 (TO TV) (VIDEO IN+OUT/DVD OUT)
Connect to your TV set or another video recorder.

AV3 (OPTICAL IN) (DIGITAL AUDIO IN)
Connect to a digital audio output on a digital device.

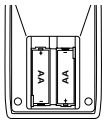
AM ANTENNA Connectors
Connect the AM antenna to this terminal.

Dust Protection Cap
Remove the dust protection cap from the OPTICAL IN jack and connect the optical digital cable (not supplied) securely so that the configurations of both the cable and the connector match. Keep the dust protection cap and always reattach the cap when not using the connector to protect against dust intrusion.



⚠
Do not touch the inner pins of the jacks on the rear panel. Electrostatic discharge may cause permanent damage to the unit.

Remote control battery installation



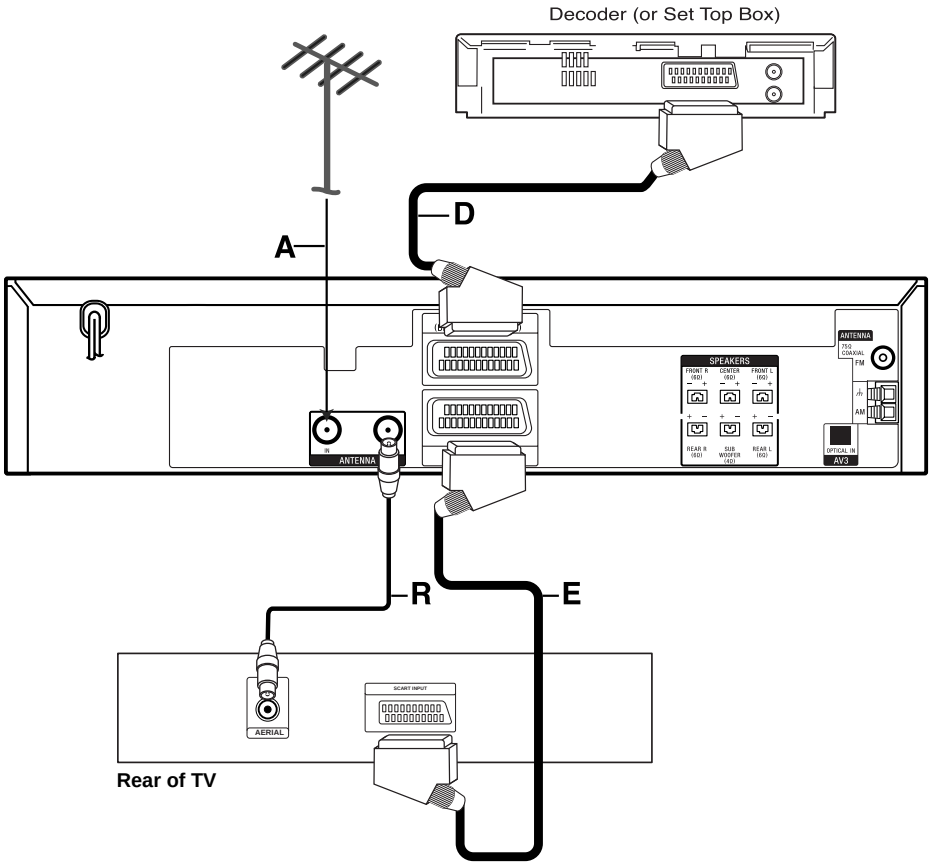
Detach the battery cover on the rear of the remote control, and insert two R6 (size AA) batteries with ⊕ and ⊖ aligned correctly.
When using the remote control, point it at the remote sensor on the unit.

⚠**Caution**
Do not mix old and new batteries. Never mix different types of batteries (standard, alkaline, etc.).

Connections

TV and Decoder (or Set Top Box) Connections

Make one of the following connections, depending on the capabilities of your existing equipment.



Tips

- Depending on your TV and other equipment you wish to connect, there are various ways you could connect the DVD/VCR Receiver. Use one of the connections described below.
- Please refer to the manuals of your TV, VIDEO, Stereo System or other devices as necessary to make the best connections.

⚠Caution

– Make sure the DVD/VCR Receiver is connected directly to the TV. Select the correct AV input on your TV.

– Do not connect your DVD/VCR Receiver to TV via your VIDEO. The DVD image could be distorted by the copy protection system.

Basic connections (AV)

1 Connect the **EURO AV1 (TO TV)** on the rear panel of the DVD/VCR Receiver to the scart input socket on the TV using a SCART lead (**E**).

2 Some TV broadcasters transmit encoded television signals which you can only see with a purchased or rented decoder.You can connect such a decoder (descrambler) to the DVD/VCR Receiver (**D**).

Basic connection (RF)

1 Connect the aerial cable (**A**) from your indoor/ outdoor aerial to **ANTENA IN** jack on the rear panel of DVD/VCR Receiver.

2 Connect the supplied RF cable (**R**) from the **ANTENA OUT** jack on the rear panel of DVD/VCR Receiver to your television's Aerial Input.

Notes

When you connect the DVD/VCR Receiver to your TV, be sure to turn off the power and unplug both units from the wall outlet before making any connections.

Connections (Continued)

Radio Aerial Connections

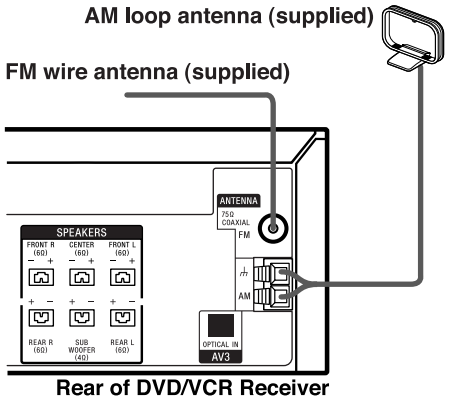
Connect the supplied FM/AM antennas for radio listening.

1 Connect the AM loop antenna to the AM antenna connectors.

2 Connect the FM wire antenna to the FM antenna connectors.

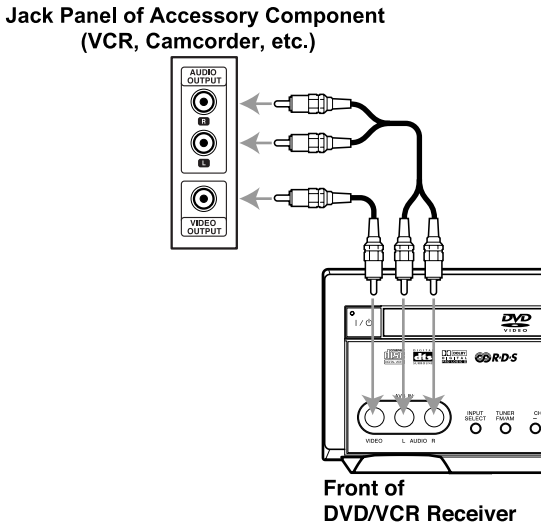
Notes

- To prevent noise pickup, keep the AM loop antenna away from the DVD/VCR Receiver and other components.
- Be sure to fully extend the FM wire antenna.
- After connecting the FM wire antenna, keep it as horizontal as possible.



Accessory Audio/Video (A/V) Connections to DVD/VCR Receiver

Connect the **AV3 IN** jacks on the DVD/VCR Receiver to the audio/video out jacks on your accessory component, using optional audio/video cables.

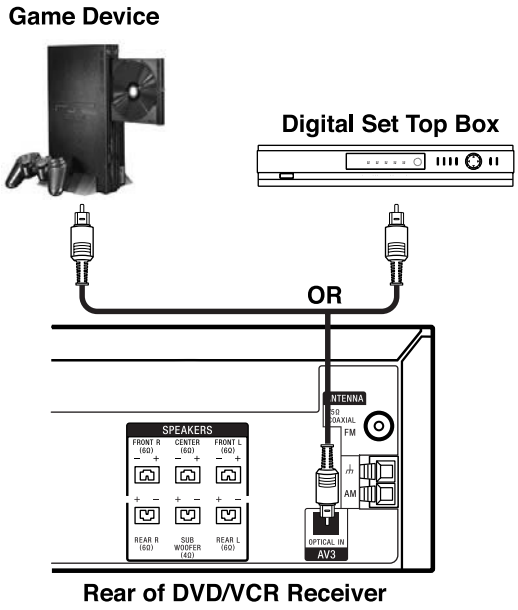


Digital Device Connections

Connect the OPTICAL IN jacks on the DVD/VCR Receiver to the digital audio out (optical) jacks on your digital device (Game device, Digital Set Top Box, etc.), using optional optical audio cable.
To select source of DVD/VCR Receiver to OPTICAL IN, press INPUT SELECT repeatedly on the remote control until "AV3 OPT" appears in the display window.

Notes

- If the audio format of the digital output does not match the capabilities of your DVD/VCR Receiver, the DVD/VCR Receiver will produce a strong, distorted sound or no sound at all.
- The Optical input function is available only when the other unit's Sampling Frequency is 32 - 48kHz.



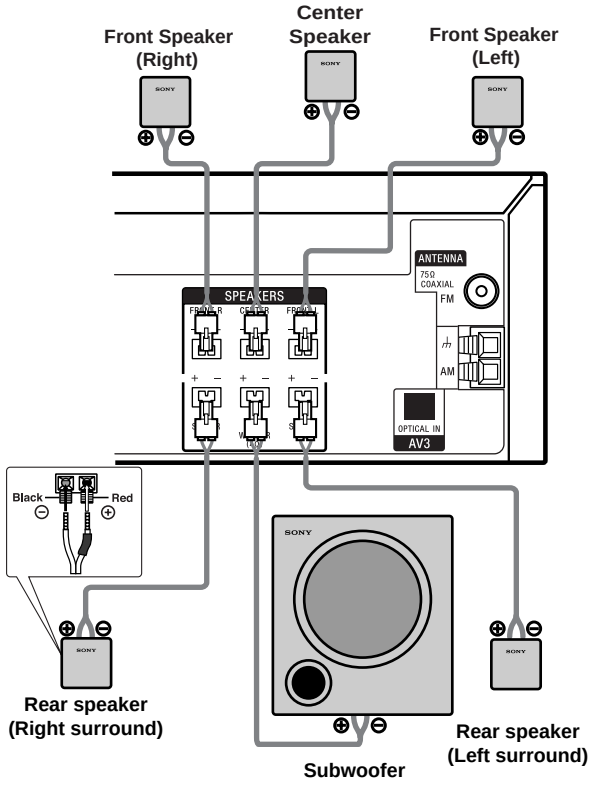
Connections (Continued)

Speaker System Connections

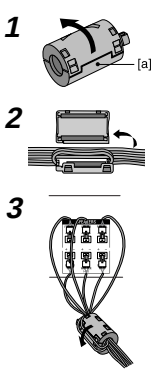
Connect the speakers using the supplied speaker cords by matching the colors of the terminals and those of the cords. To obtain the best possible surround sound, adjust the speaker parameters (distance, level, etc.).

Notes

- Be sure to match the speaker cord to the appropriate terminal on the components: ⊕ to ⊕ and ⊖ to ⊖. If the cords are reversed, the sound will be distorted and lack bass.
- If you use front speakers with low maximum input rating, adjust the volume carefully to avoid excessive volume output to the speakers.
- Do not disassemble the front covers of supplied speakers.



About Ferrite Core



Be sure to attach the ferrite core to the speaker cables (for connecting to this unit).
This ferrite core can reduce noises.

How to attach the ferrite core.

1 Push the stopper [a] of the ferrite core to open.

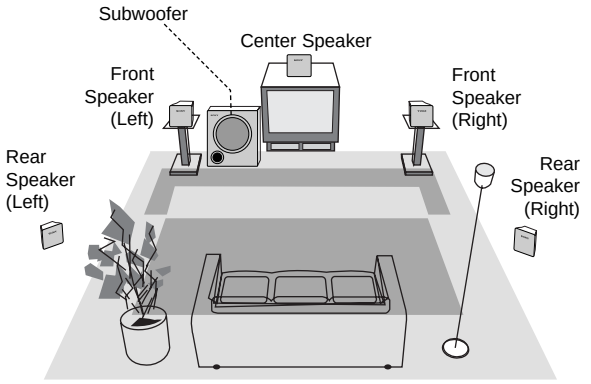
2 Wind the Center and Subwoofer Speaker cables once on the ferrite core. Pass the others straight on the ferrite core.

3 Close the ferrite core until it clicks.

Speaker Positioning

For a normal setup use 6 speakers (2 front speakers, center speaker, 2 rear speakers and subwoofer).

- **Front Speakers**
  Based on your listening position, set up the speakers at equal distance. And by hearing position, set up an interval between speakers of 45 degree.
- **Center Speaker**
  It is ideal that the center speakers and front speakers are same height. But normally place it above or below the television as shown below.
- **Rear Speakers**
  Place the rear surround speakers to the left and right behind the primary listening area. These speakers recreate sound motion and atmosphere required for surround playback. For best results, do not install the rear speakers too far behind the listening position, install them at or above the level of the listener's ears. It is also effective to direct the rear speakers towards a wall or ceiling to further disperse the sound.
  In the case of a smaller room size, if the audience is near to the rear wall set the rear speakers opposite each other, and set the rear speakers 60 - 90 cm above the listener's ears.
- **Subwoofer**
  This can be placed in any front position.

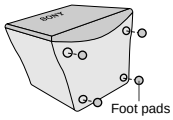


Speaker Positioning Example

Note
Speaker stand is optional.

Attaching the foot pads

To prevent speaker vibration or movement while listening, attach the supplied foot pads to the speaker, as shown.

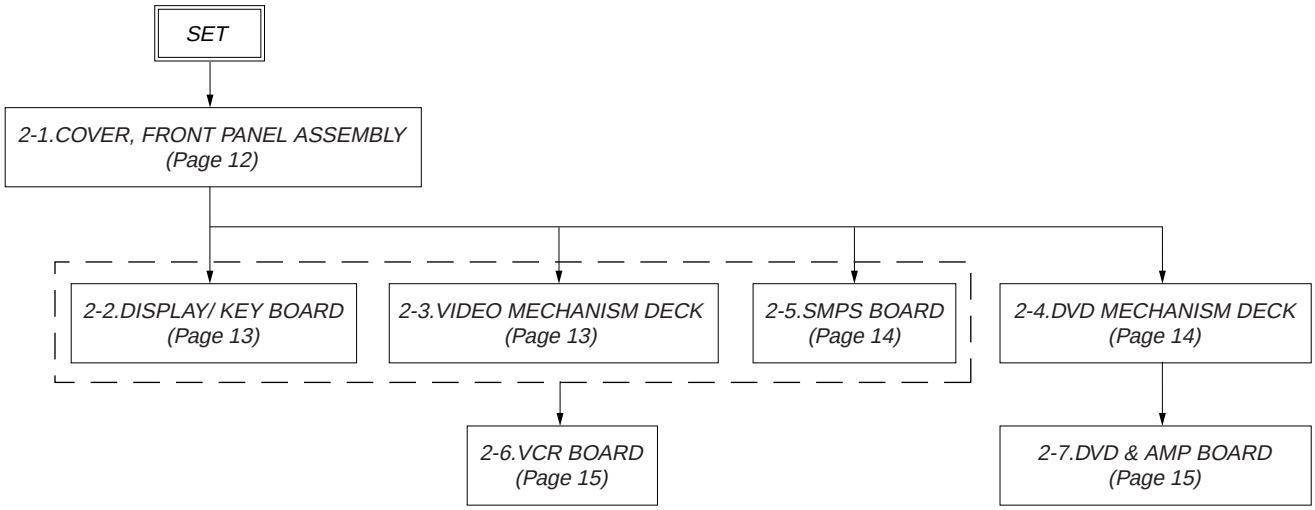


Attaching the color labels

Attach the color labels onto the rear panel of the speakers before connecting the speakers.

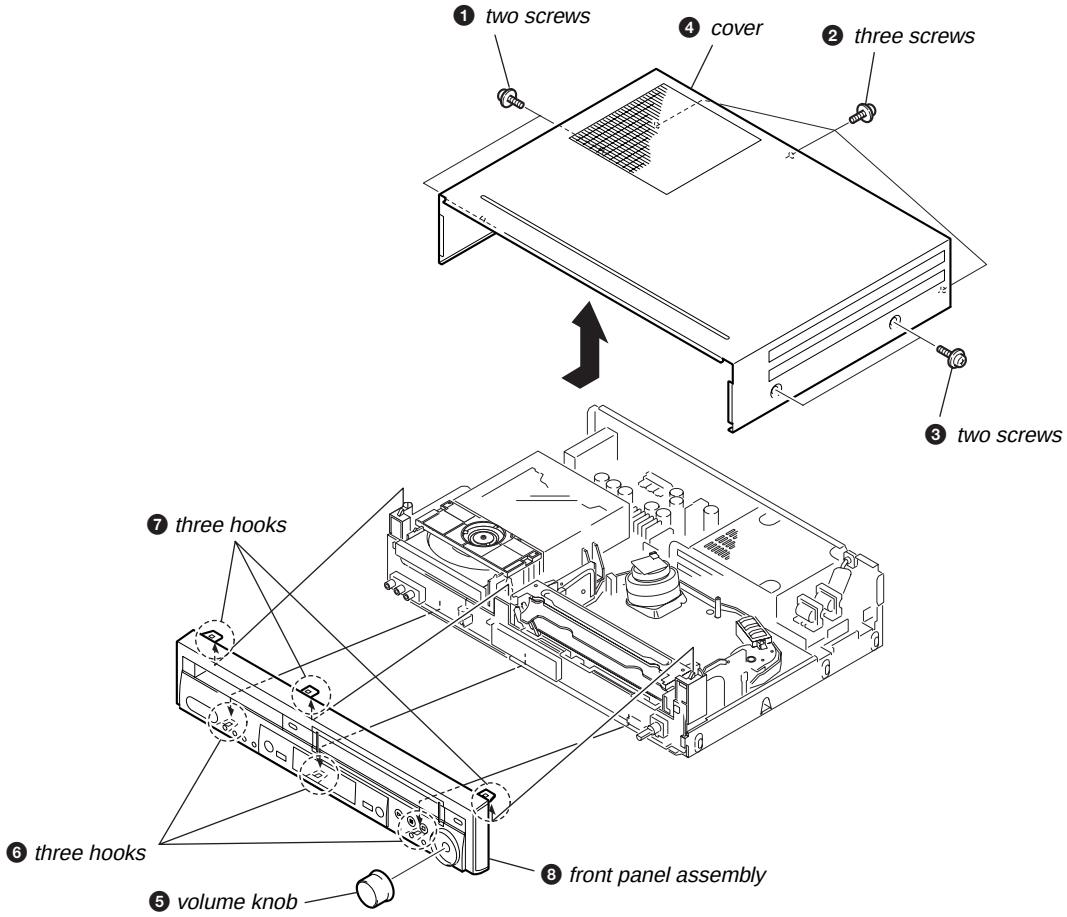
SECTION 2
DISASSEMBLY

- This set can be disassembled in the order shown below.
- The dotted square with arrow (⬚⊢) prompts you to move to the next job when all of the works within the dotted square (⬚) are completed.

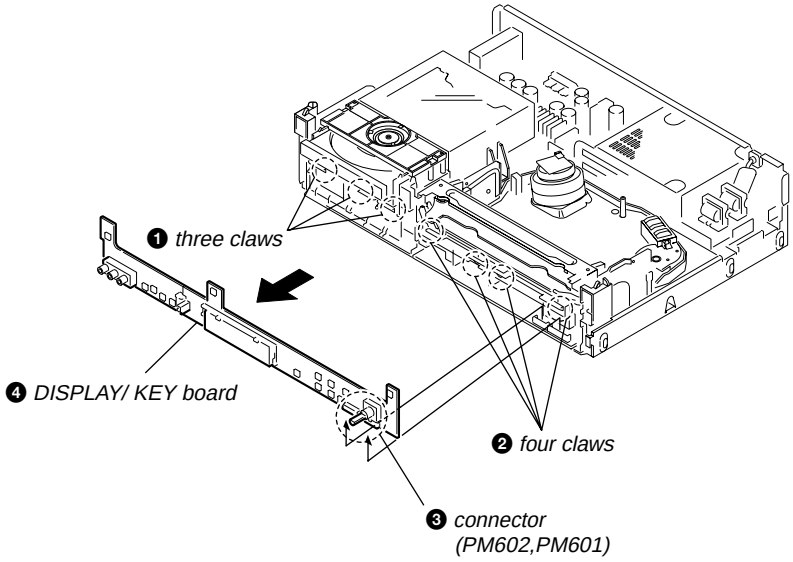

SET
2-1.COVER, FRONT PANEL ASSEMBLY (Page 12)
2-2.DISPLAY/ KEY BOARD (Page 13)
2-3.VIDEO MECHANISM DECK (Page 13)
2-5.SMPS BOARD (Page 14)
2-4.DVD MECHANISM DECK (Page 14)
2-6.VCR BOARD (Page 15)
2-7.DVD & AMP BOARD (Page 15)

Note: Follow the disassembly procedure in the numerical order given.

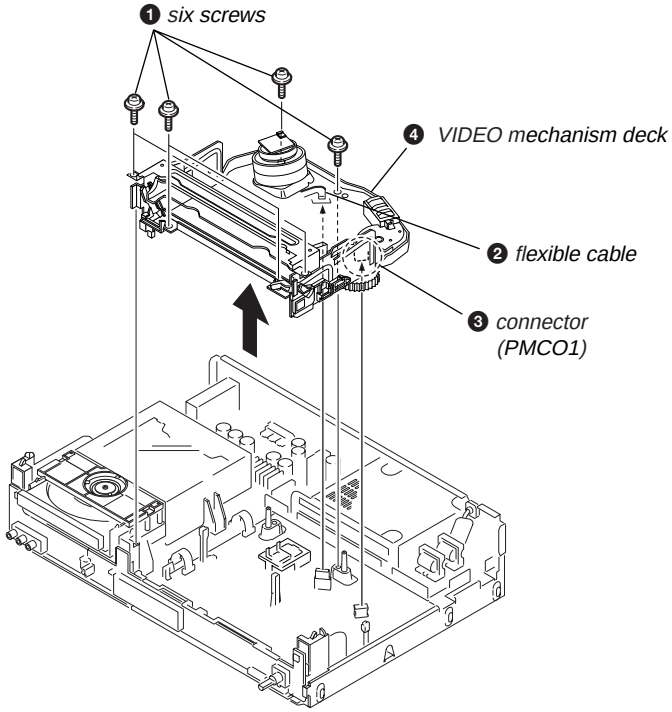
2-1. COVER, FRONT PANEL ASSEMBLY



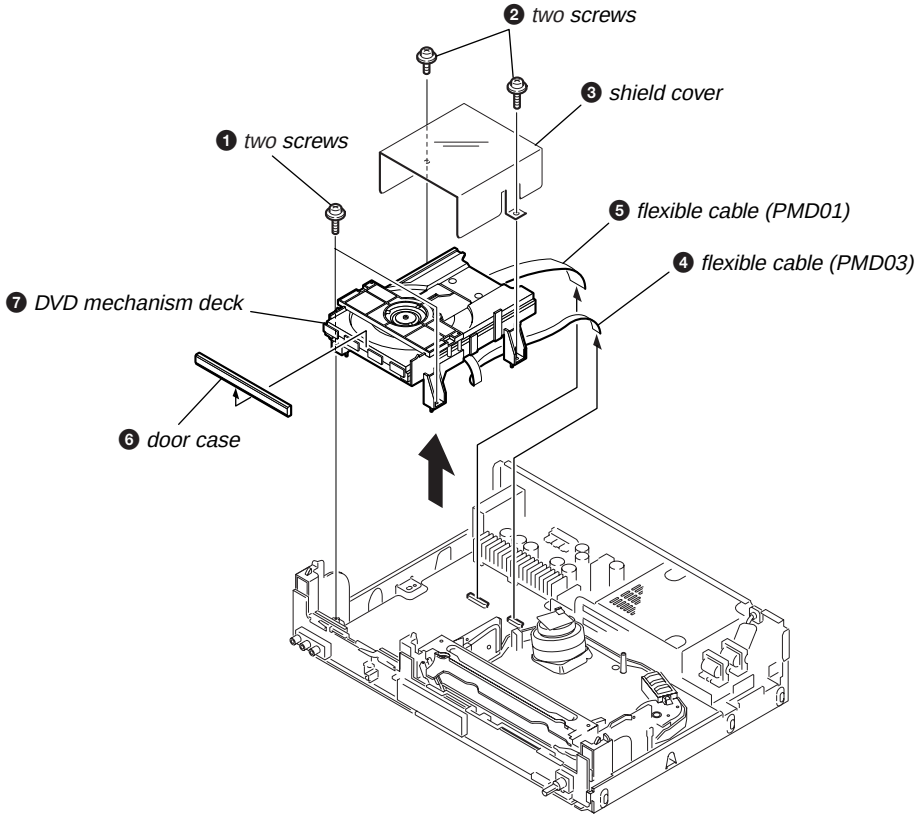
2-2. DISPLAY/KEY BOARD



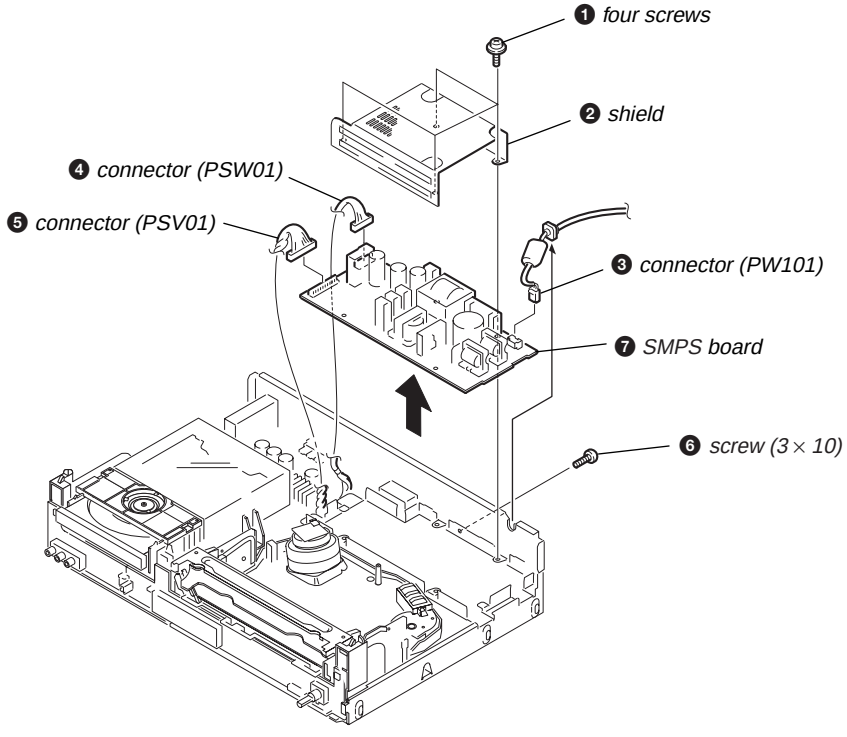
2-3. VIDEO MECHANISM DECK



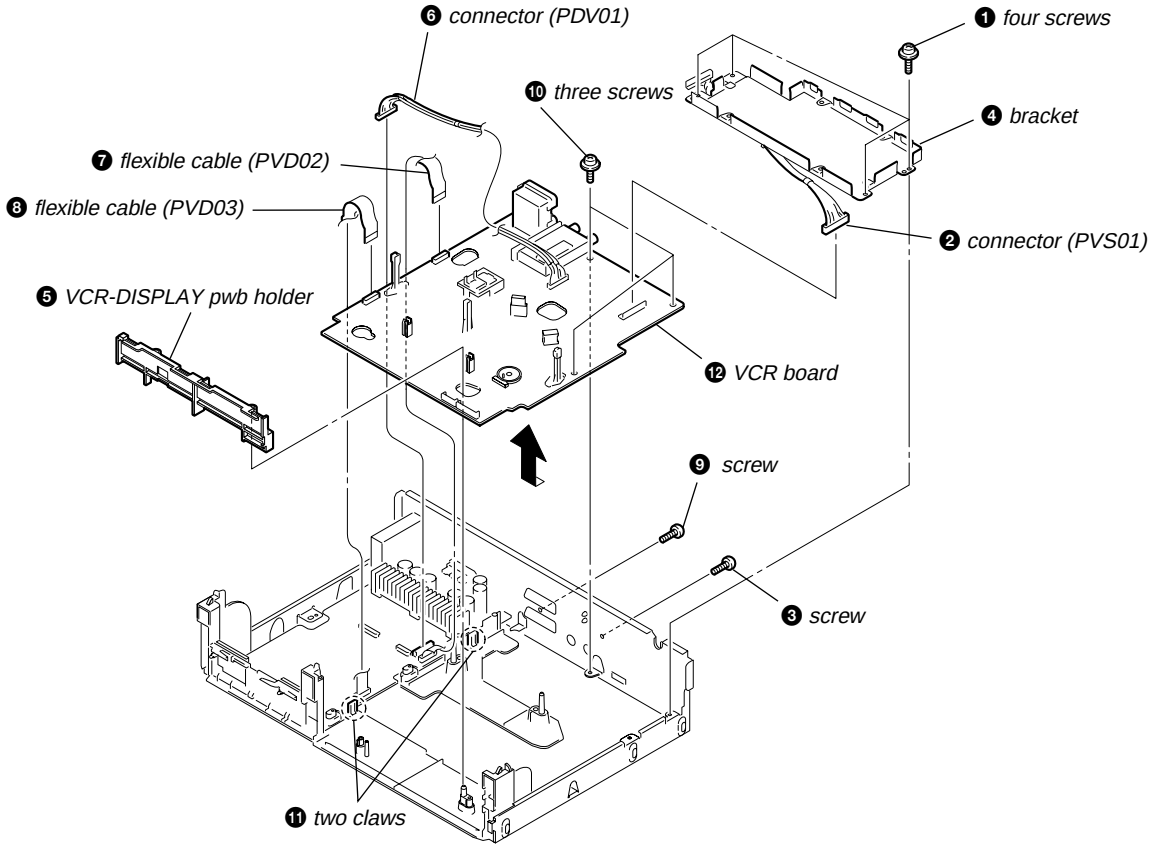
2-4. DVD MECHANISM DECK



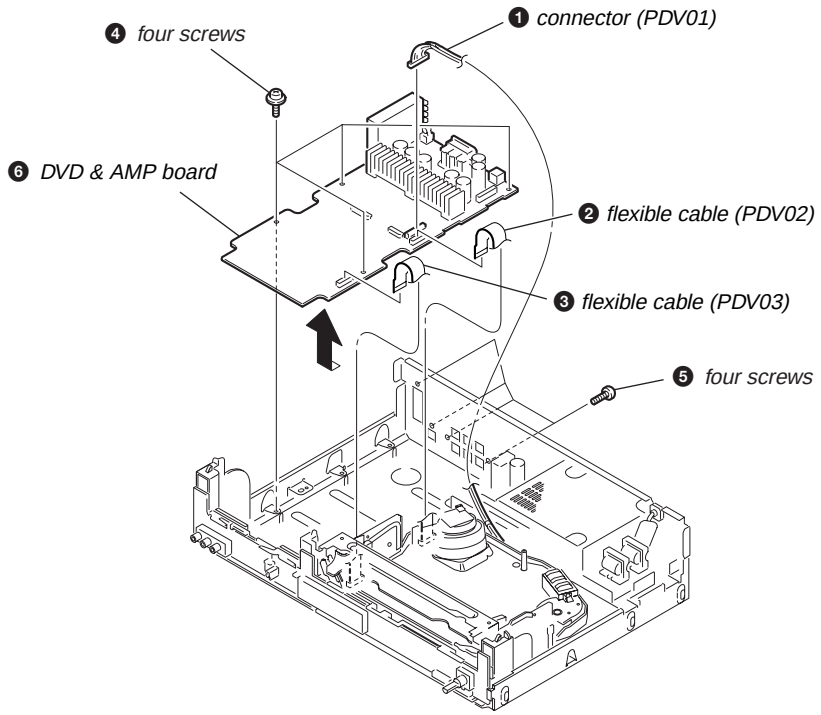
2-5. SMPS BOARD



2-6. VCR BOARD



2-7. DVD & AMP BOARD



SECTION 3
ELECTRICAL ADJUSTMENTS

3-1. VCR SECTION ELECTRICAL ADJUSTMENT

1. Servo Adjustment

1) PG Adjustment

• Test Equipment
  a) OSCILLOSCOPE
  b) NTSC MODEL : NTSC SP TEST TAPE

• Adjustment And Specification

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY	V.Out H/SW(W373, W374)	R/C TRK JIG KEY	6.5 ± 0.5H

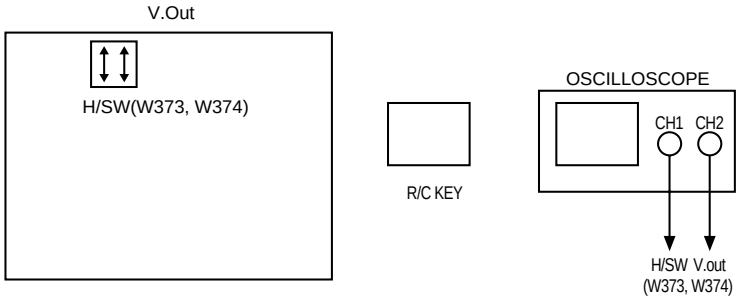
• Adjustment Procedure

a) Insert the SP Test Tape and play.
b) Connect the CH1 of the oscilloscope to the H/SW(W373, W374) and CH2 to the Video Out for the VCR.
c) Trigger the mixed Combo Video Signal of CH2 to the CH1 H/SW(W373, W374), and then check the distance (time difference), which is from the selected A(B) Head point of the H/SW(W373, W374) signal to the starting point of the vertical synchronized signal, to 6.5H ± 0.5H (412µs, 1H=63µs).
  Note - Press FRONT CH UP KEY and FRONT PLAY KEY on Deck playback, and it goes in to ATR PRESET. after the SP Test Tape is inserted.

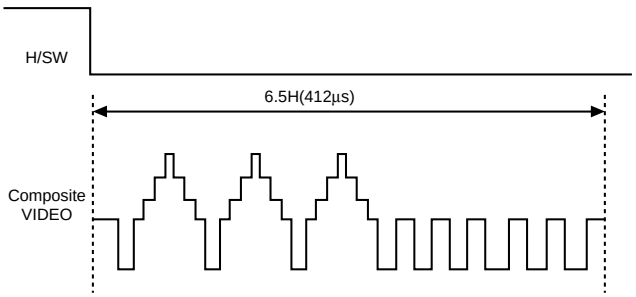
• PG Adjustment Method

a-1) Payback the SP standard tape
b-2) Press the “O” key on the Remote controller and the “PLAY” key on the Front Panel the same time, then it goes in to Tracking initial mode.
c-3) Repeat the above step(No.b-2), then it finishes the PG adjusting automatically.
d-4) Stop the playback, then it goes out to PG adjusting mode after mony the PG data.

• CONNECTION



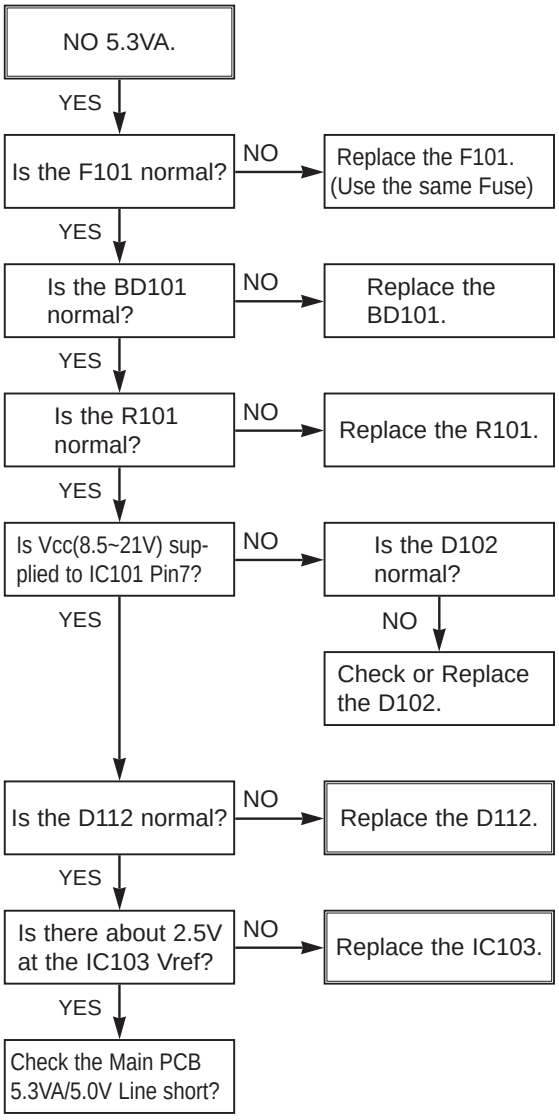
• WAVEFORM



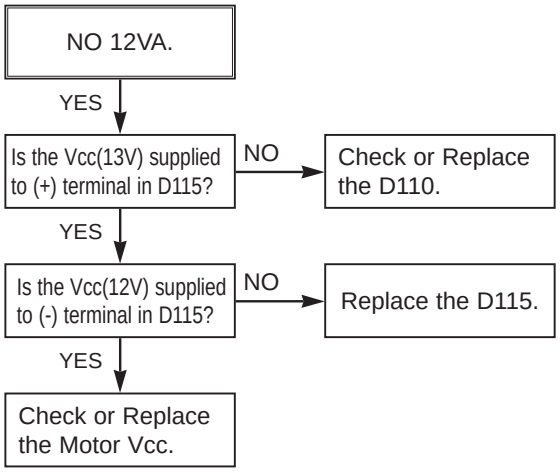
3-2. ELECTRICAL TROUBLESHOOTING GUIDE

1. Power (SMPS) CIRCUIT

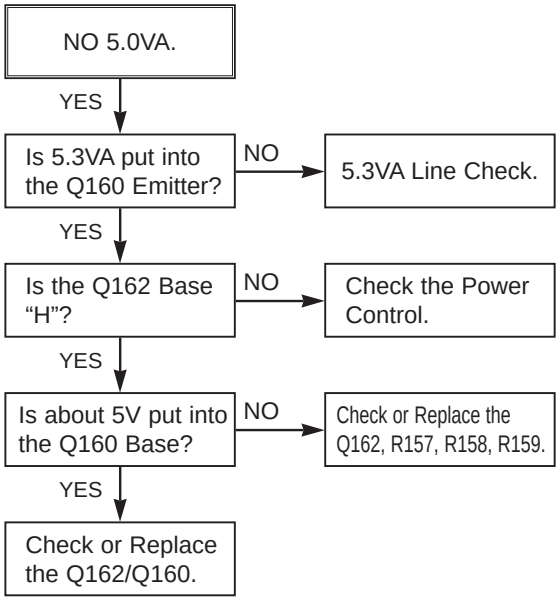
(1) No 5.3VA (SYS/Hi-Fi/TUNER)



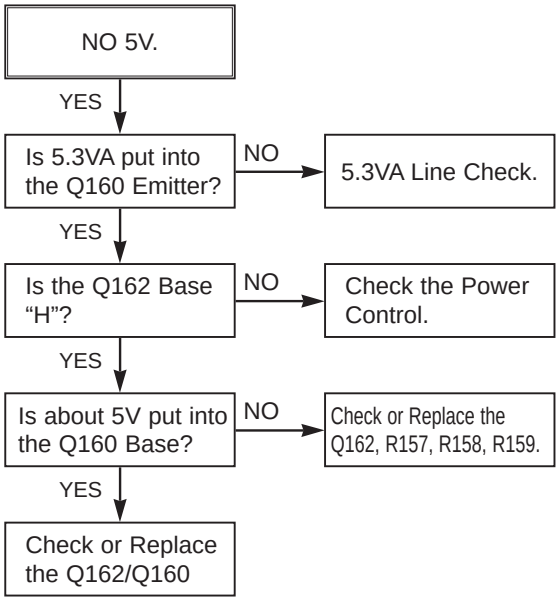
(2) No 12VA (TO CAP, DRUM MOTOR)



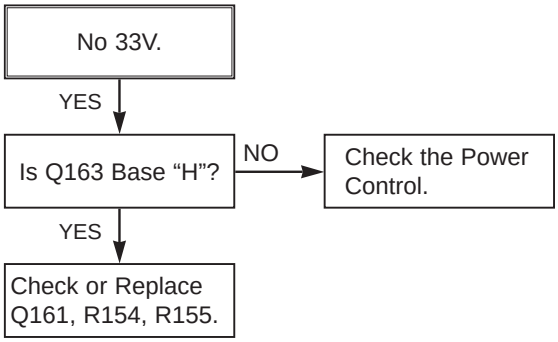
(3) No 5.0V (SYS/Hi-Fi/TUNER)



(4) No 5V (TO DVD)

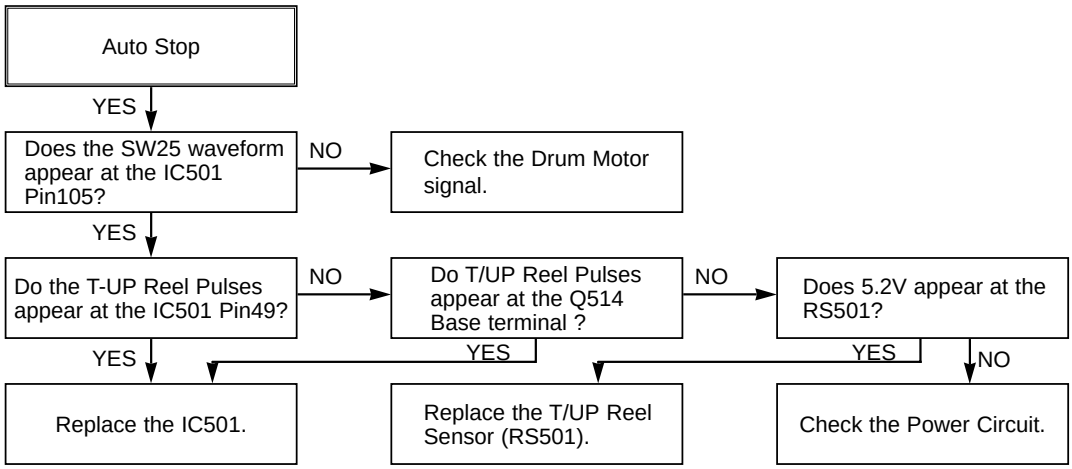


(5) No 33V (TUNER)

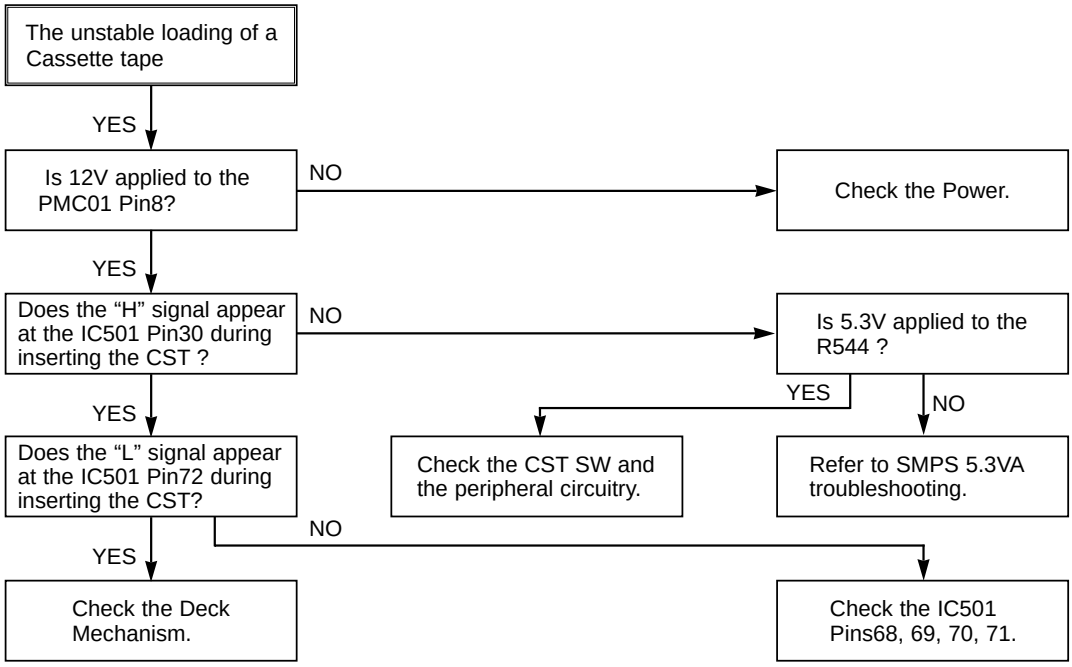


2. SYSTEM/KEY CIRCUIT

(1) AUTO STOP



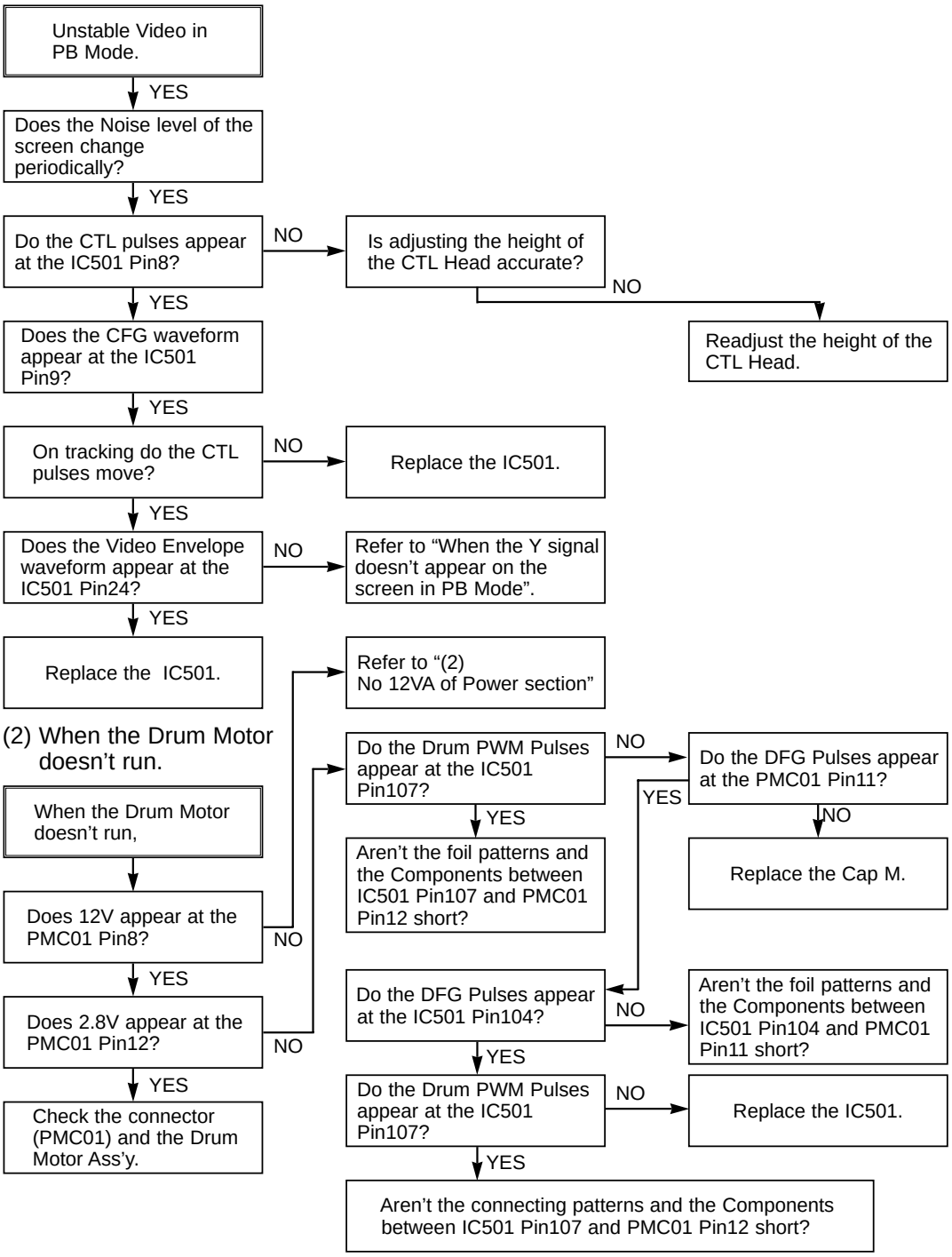
(2) The unstable loading of a Cassette tape


The unstable loading of a Cassette tape
YES
Is 12V applied to the PMC01 Pin8?
NO
Check the Power.
YES
Does the “H” signal appear at the IC501 Pin30 during inserting the CST ?
NO
Is 5.3V applied to the R544 ?
YES
NO
YES
Does the “L” signal appear at the IC501 Pin72 during inserting the CST?
Check the CST SW and the peripheral circuitry.
Refer to SMPS 5.3VA troubleshooting.
NO
YES
Check the Deck Mechanism.
Check the IC501 Pins68, 69, 70, 71.

Caution : Auto stop can occur because Grease or Oil is dried up

3. SERVO CIRCUIT

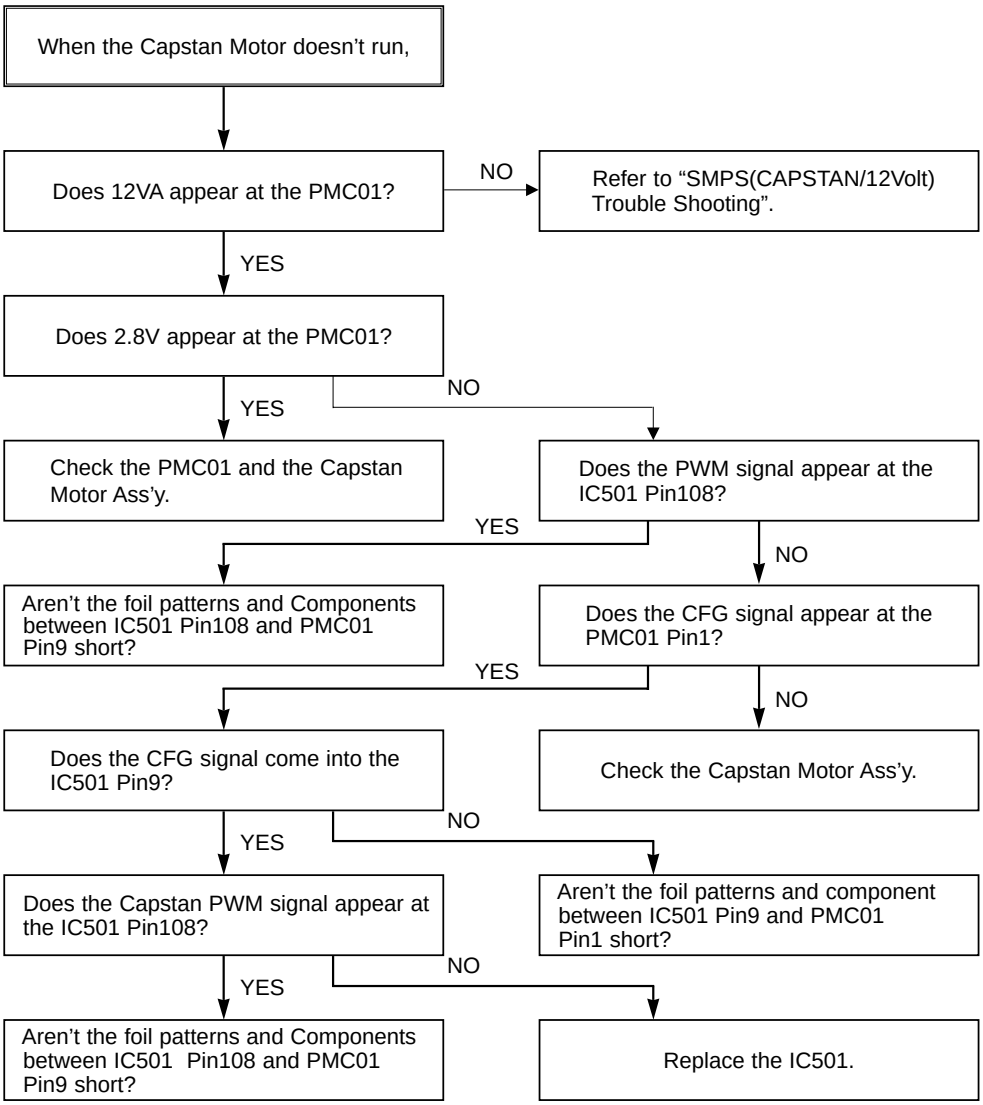
(1) Unstable Video in PB MODE


Unstable Video in PB Mode.
YES
Does the Noise level of the screen change periodically?
YES
Do the CTL pulses appear at the IC501 Pin8?
NO
Is adjusting the height of the CTL Head accurate?
NO
Readjust the height of the CTL Head.
YES
Does the CFG waveform appear at the IC501 Pin9?
YES
On tracking do the CTL pulses move?
NO
Replace the IC501.
YES
Does the Video Envelope waveform appear at the IC501 Pin24?
NO
Refer to "When the Y signal doesn't appear on the screen in PB Mode".
YES
Replace the IC501.

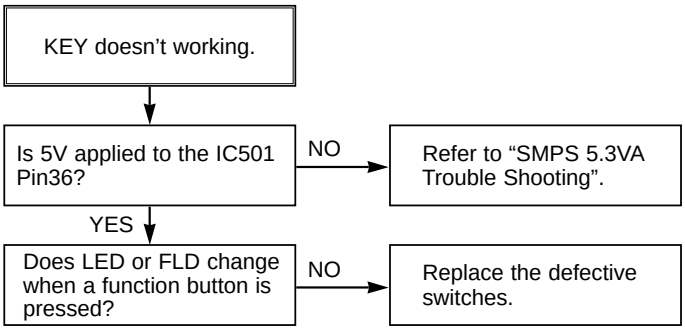
(2) When the Drum Motor doesn't run.

When the Drum Motor doesn't run,
Does 12V appear at the PMC01 Pin8?
NO
Refer to "(2) No 12VA of Power section"
YES
Does 2.8V appear at the PMC01 Pin12?
NO
Do the Drum PWM Pulses appear at the IC501 Pin107?
NO
Do the DFG Pulses appear at the PMC01 Pin11?
YES
YES
NO
Aren't the foil patterns and the Components between IC501 Pin107 and PMC01 Pin12 short?
Replace the Cap M.
YES
Check the connector (PMC01) and the Drum Motor Ass'y.
Do the DFG Pulses appear at the IC501 Pin104?
NO
Aren't the foil patterns and the Components between IC501 Pin104 and PMC01 Pin11 short?
YES
Do the Drum PWM Pulses appear at the IC501 Pin107?
NO
Replace the IC501.
YES
Aren't the connecting patterns and the Components between IC501 Pin107 and PMC01 Pin12 short?

(3) When the Capstan Motor doesn't run,

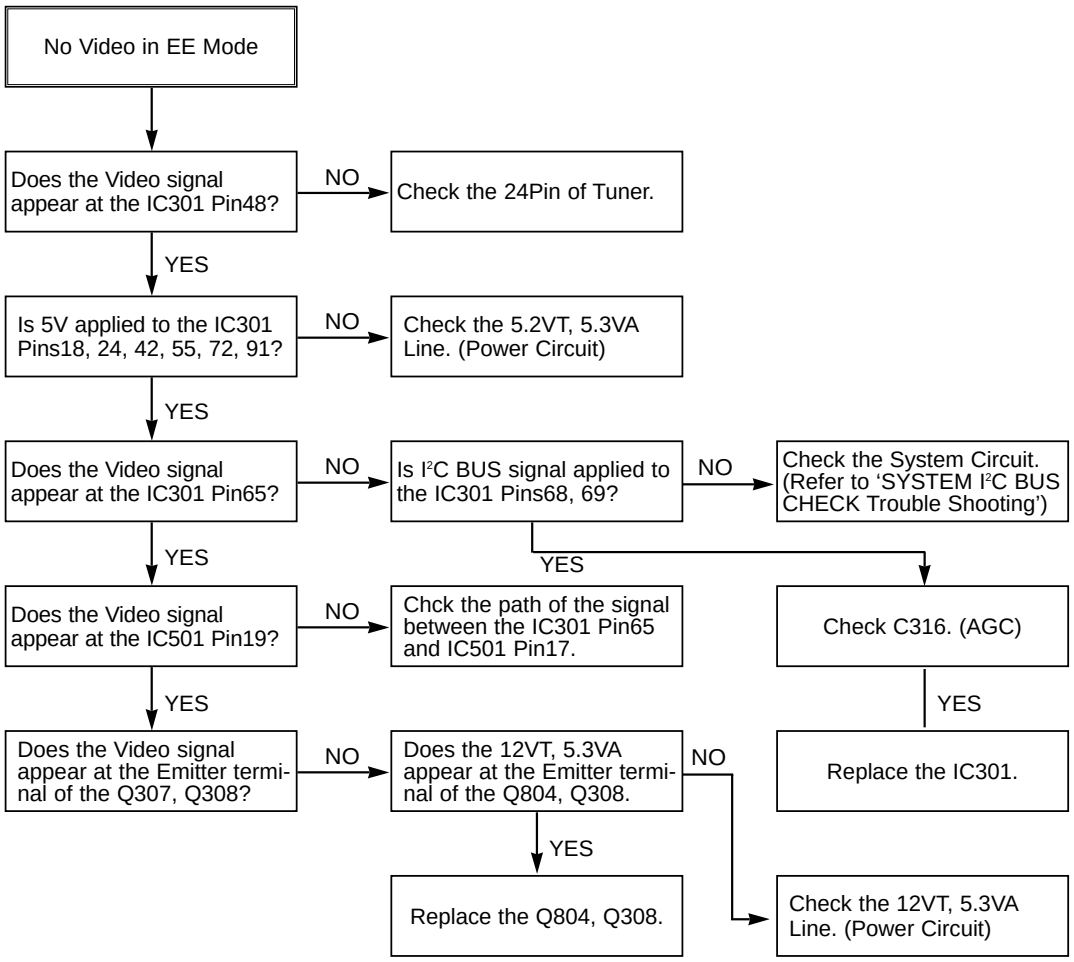

When the Capstan Motor doesn't run,
Does 12VA appear at the PMC01?
NO
Refer to "SMPS(CAPSTAN/12Volt) Trouble Shooting".
YES
Does 2.8V appear at the PMC01?
NO
YES
Check the PMC01 and the Capstan Motor Ass'y.
Does the PWM signal appear at the IC501 Pin108?
YES
NO
Aren't the foil patterns and Components between IC501 Pin108 and PMC01 Pin9 short?
Does the CFG signal appear at the PMC01 Pin1?
YES
NO
Does the CFG signal come into the IC501 Pin9?
Check the Capstan Motor Ass'y.
NO
YES
Does the Capstan PWM signal appear at the IC501 Pin108?
Aren't the foil patterns and component between IC501 Pin9 and PMC01 Pin1 short?
NO
YES
Aren't the foil patterns and Components between IC501 Pin108 and PMC01 Pin9 short?
Replace the IC501.

(4) KEY doesn't working

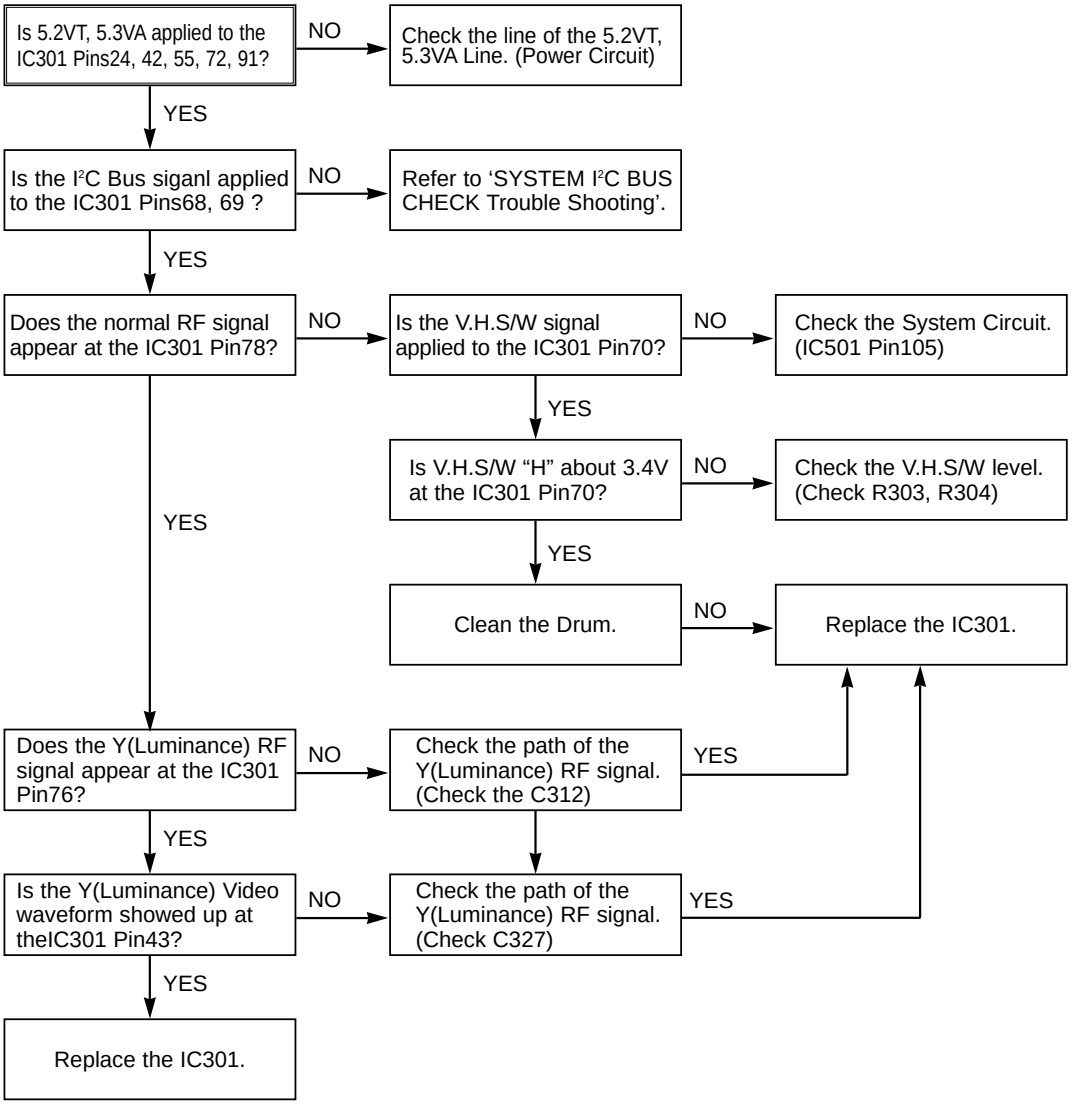

KEY doesn't working.
Is 5V applied to the IC501 Pin36?
NO
Refer to "SMPS 5.3VA Trouble Shooting".
YES
Does LED or FLD change when a function button is pressed?
NO
Replace the defective switches.

4. Y/C CIRCUIT

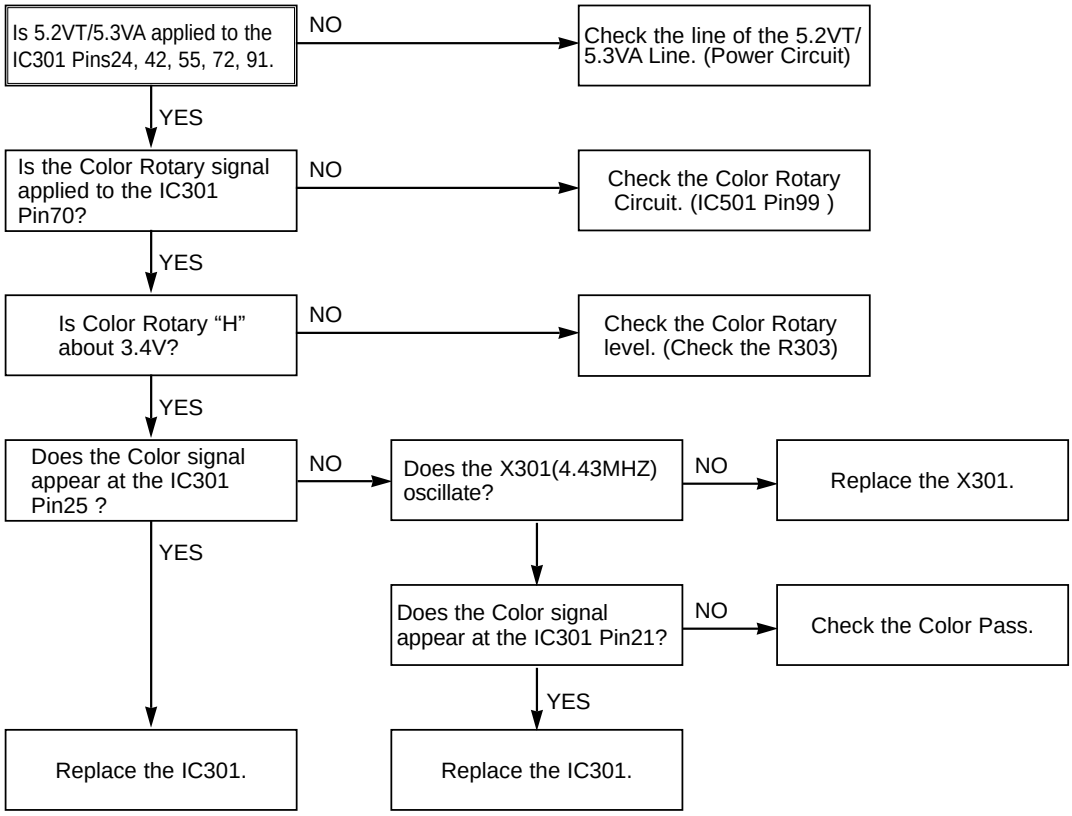
(1) No Video in EE Mode,


No Video in EE Mode
Does the Video signal appear at the IC301 Pin48?
NO
Check the 24Pin of Tuner.
YES
Is 5V applied to the IC301 Pins18, 24, 42, 55, 72, 91?
NO
Check the 5.2VT, 5.3VA Line. (Power Circuit)
YES
Does the Video signal appear at the IC301 Pin65?
NO
Is I²C BUS signal applied to the IC301 Pins68, 69?
NO
Check the System Circuit. (Refer to 'SYSTEM I²C BUS CHECK Trouble Shooting')
YES
YES
Does the Video signal appear at the IC501 Pin19?
NO
Chck the path of the signal between the IC301 Pin65 and IC501 Pin17.
Check C316. (AGC)
YES
YES
Does the Video signal appear at the Emitter terminal of the Q307, Q308?
NO
Does the 12VT, 5.3VA appear at the Emitter terminal of the Q804, Q308.
NO
Replace the IC301.
YES
Replace the Q804, Q308.
Check the 12VT, 5.3VA Line. (Power Circuit)

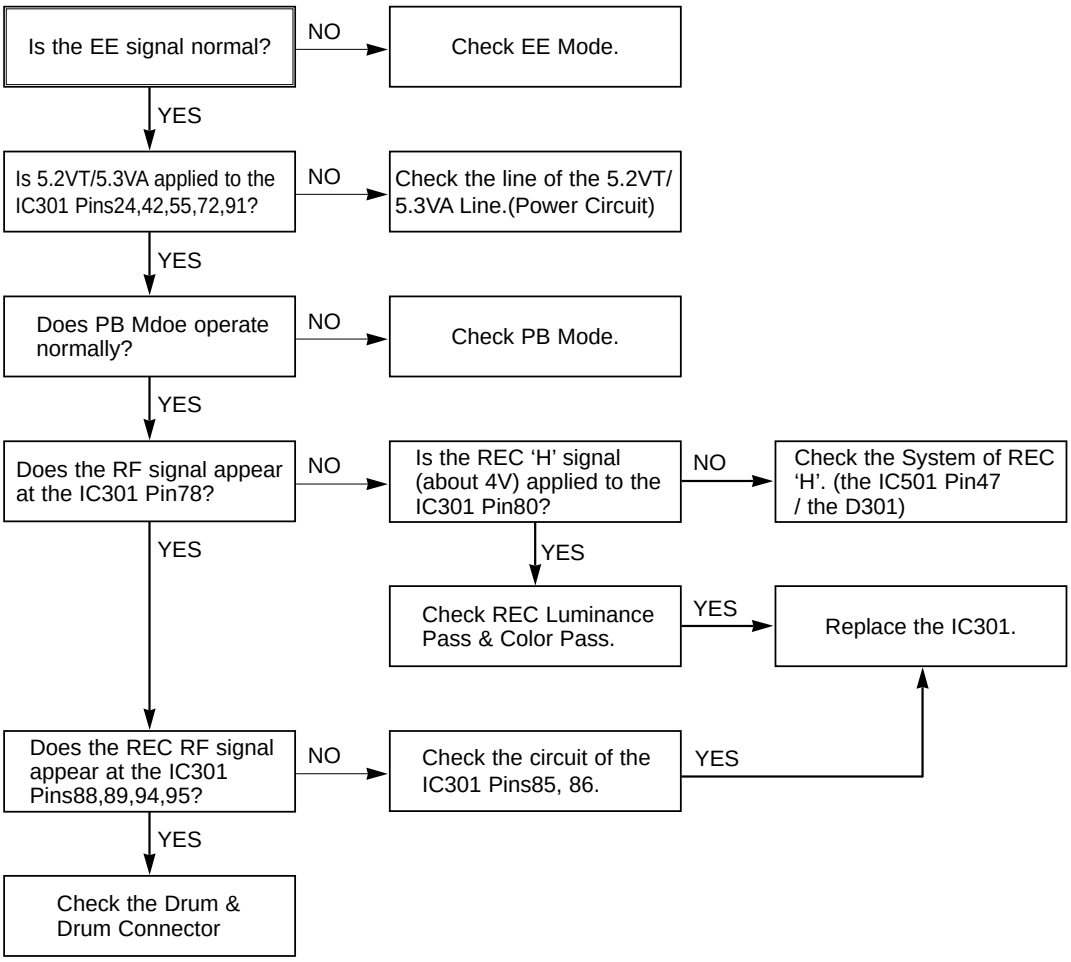
(2) When the Y(Luminance) signal doesn't appear on the screen in PB Mode,


Is 5.2VT, 5.3VA applied to the IC301 Pins24, 42, 55, 72, 91?
NO
Check the line of the 5.2VT, 5.3VA Line. (Power Circuit)
YES
Is the I²C Bus siganl applied to the IC301 Pins68, 69 ?
NO
Refer to 'SYSTEM I²C BUS CHECK Trouble Shooting'.
YES
Does the normal RF signal appear at the IC301 Pin78?
NO
Is the V.H.S/W signal applied to the IC301 Pin70?
NO
Check the System Circuit. (IC501 Pin105)
YES
Is V.H.S/W "H" about 3.4V at the IC301 Pin70?
NO
Check the V.H.S/W level. (Check R303, R304)
YES
Clean the Drum.
NO
Replace the IC301.
YES
Does the Y(Luminance) RF signal appear at the IC301 Pin76?
NO
Check the path of the Y(Luminance) RF signal. (Check the C312)
YES
YES
Is the Y(Luminance) Video waveform showed up at theIC301 Pin43?
NO
Check the path of the Y(Luminance) RF signal. (Check C327)
YES
YES
Replace the IC301.

(3) When the C(Color) signal doesn't appear on the screen in PB Mode,

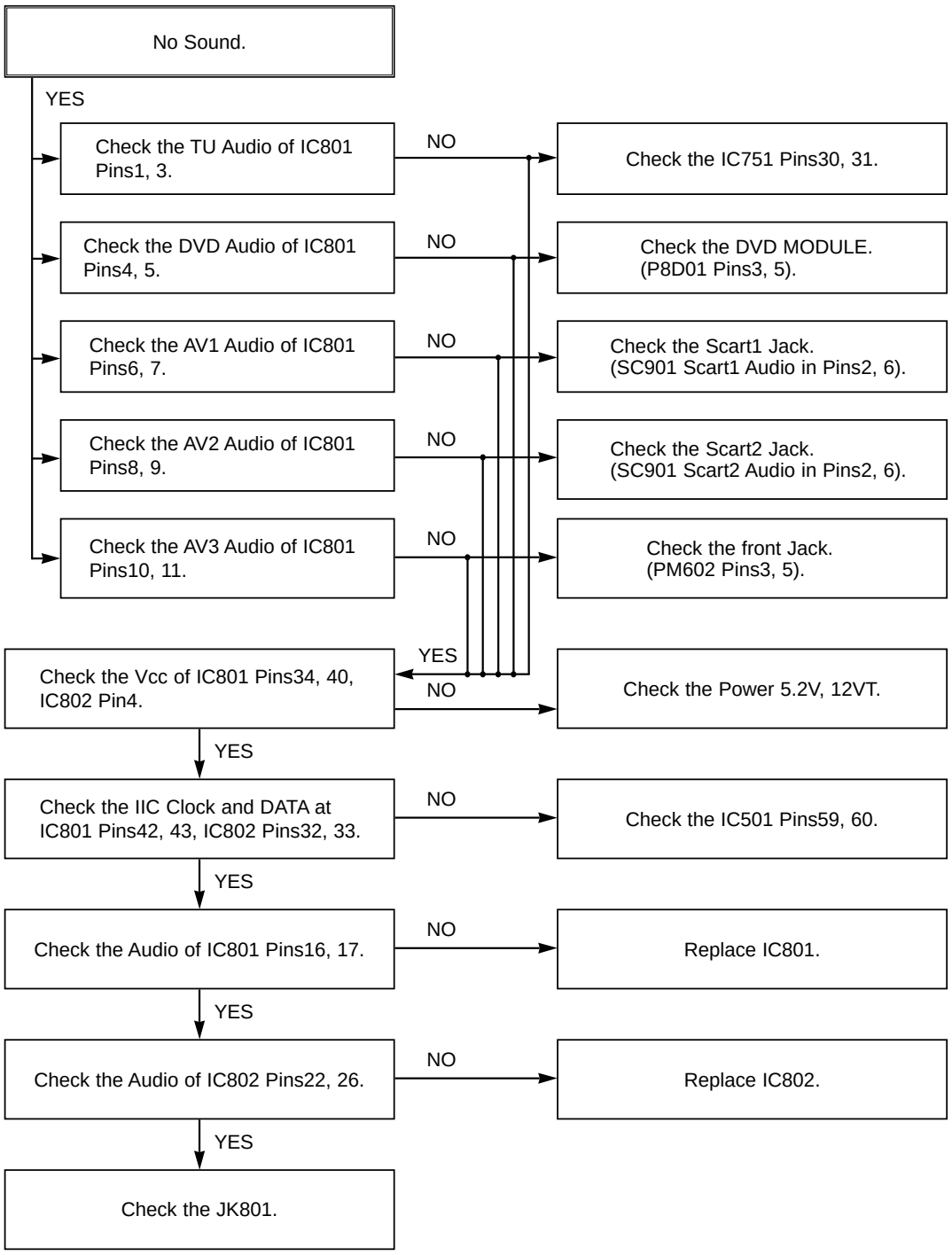

Is 5.2VT/5.3VA applied to the IC301 Pins24, 42, 55, 72, 91.
NO
Check the line of the 5.2VT/ 5.3VA Line. (Power Circuit)
YES
Is the Color Rotary signal applied to the IC301 Pin70?
NO
Check the Color Rotary Circuit. (IC501 Pin99)
YES
Is Color Rotary "H" about 3.4V?
NO
Check the Color Rotary level. (Check the R303)
YES
Does the Color signal appear at the IC301 Pin25 ?
NO
Does the X301(4.43MHZ) oscillate?
NO
Replace the X301.
YES
Does the Color signal appear at the IC301 Pin21?
NO
Check the Color Pass.
YES
Replace the IC301.
Replace the IC301.

(4) When the Video signal doesn't appear on the screen in REC Mode,

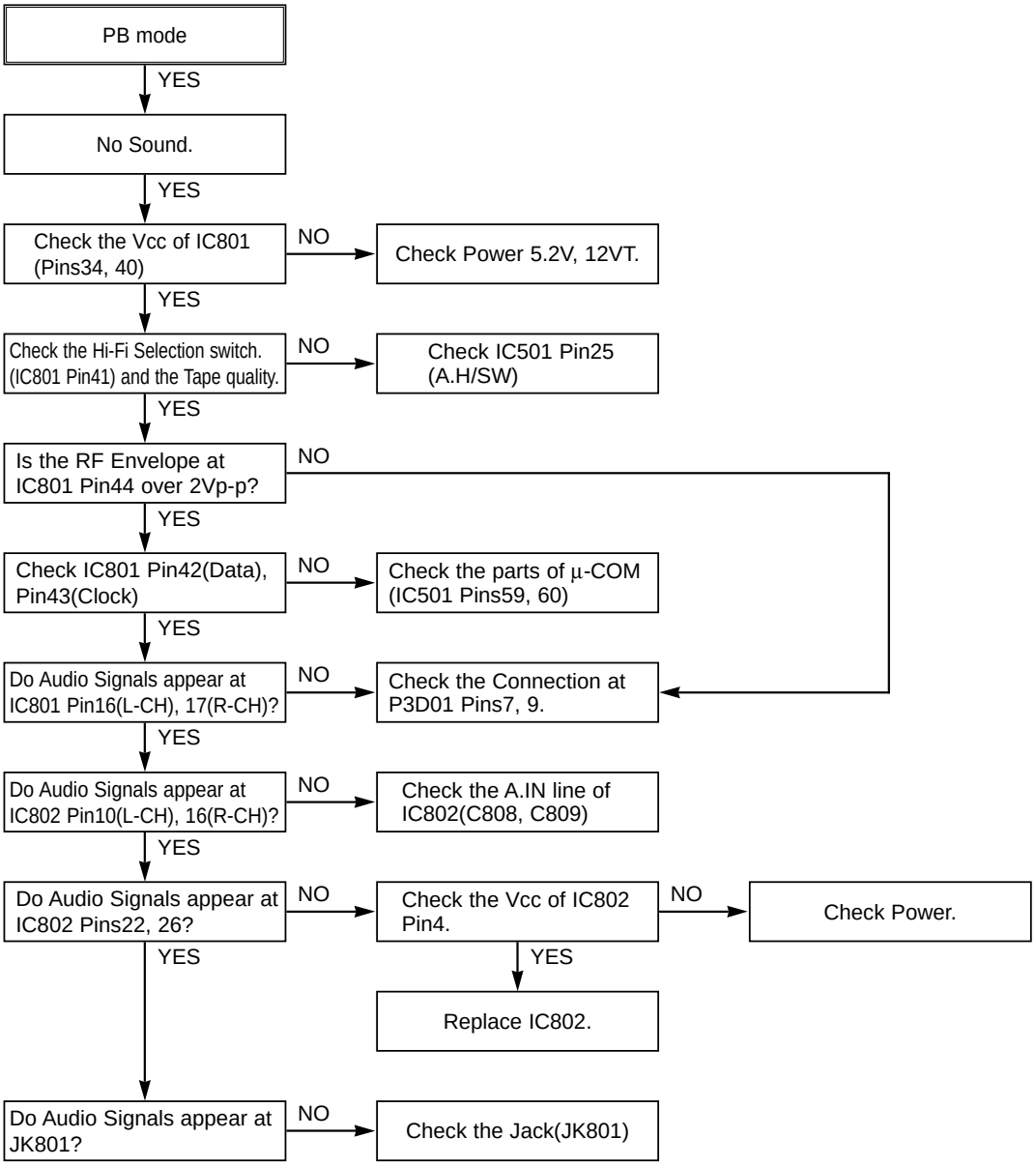

Is the EE signal normal?
NO
Check EE Mode.
YES
Is 5.2VT/5.3VA applied to the IC301 Pins24,42,55,72,91?
NO
Check the line of the 5.2VT/ 5.3VA Line.(Power Circuit)
YES
Does PB Mdoe operate normally?
NO
Check PB Mode.
YES
Does the RF signal appear at the IC301 Pin78?
NO
Is the REC 'H' signal (about 4V) applied to the IC301 Pin80?
NO
Check the System of REC 'H'. (the IC501 Pin47 / the D301)
YES
YES
Check REC Luminance Pass & Color Pass.
YES
Replace the IC301.
Does the REC RF signal appear at the IC301 Pins88,89,94,95?
NO
Check the circuit of the IC301 Pins85, 86.
YES
YES
Check the Drum & Drum Connector

5. Hi-Fi CIRCUIT

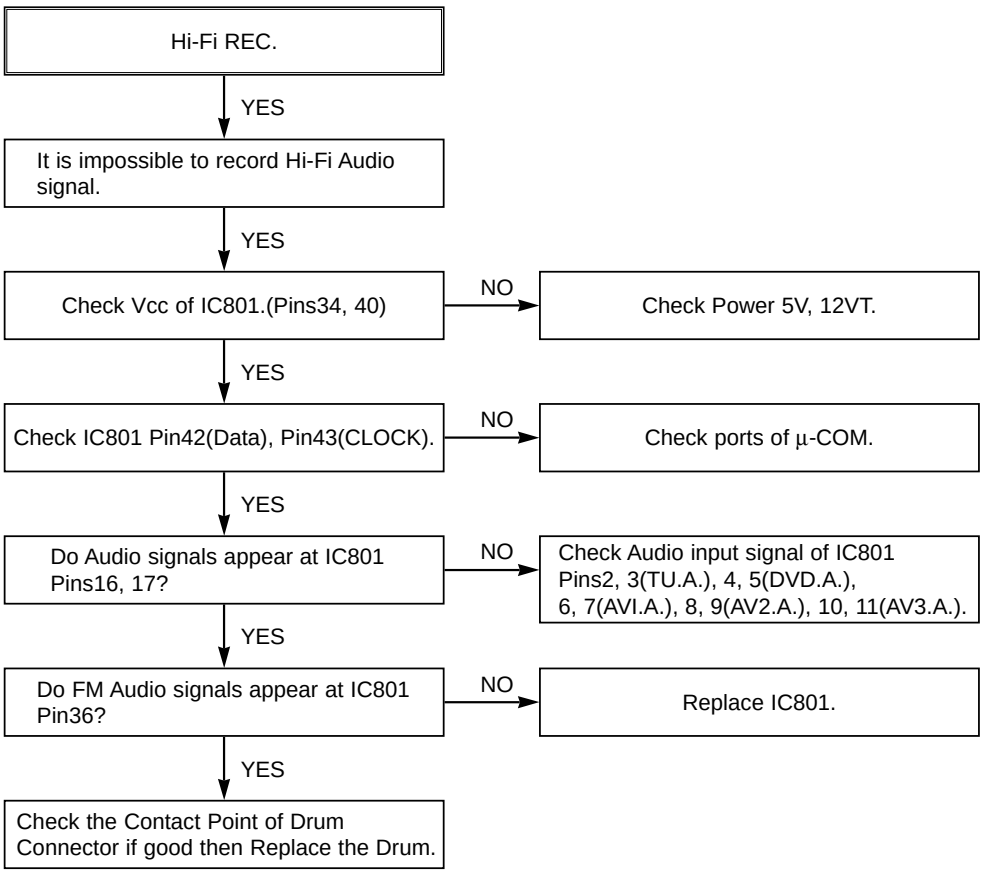
(A) No Sound(EE Mode)


No Sound.
YES
Check the TU Audio of IC801 Pins1, 3.
NO
Check the IC751 Pins30, 31.
Check the DVD Audio of IC801 Pins4, 5.
NO
Check the DVD MODULE. (P8D01 Pins3, 5).
Check the AV1 Audio of IC801 Pins6, 7.
NO
Check the Scart1 Jack. (SC901 Scart1 Audio in Pins2, 6).
Check the AV2 Audio of IC801 Pins8, 9.
NO
Check the Scart2 Jack. (SC901 Scart2 Audio in Pins2, 6).
Check the AV3 Audio of IC801 Pins10, 11.
NO
Check the front Jack. (PM602 Pins3, 5).
Check the Vcc of IC801 Pins34, 40, IC802 Pin4.
YES
NO
Check the Power 5.2V, 12VT.
YES
Check the IIC Clock and DATA at IC801 Pins42, 43, IC802 Pins32, 33.
NO
Check the IC501 Pins59, 60.
YES
Check the Audio of IC801 Pins16, 17.
NO
Replace IC801.
YES
Check the Audio of IC802 Pins22, 26.
NO
Replace IC802.
YES
Check the JK801.

(B) Hi-Fi Playback

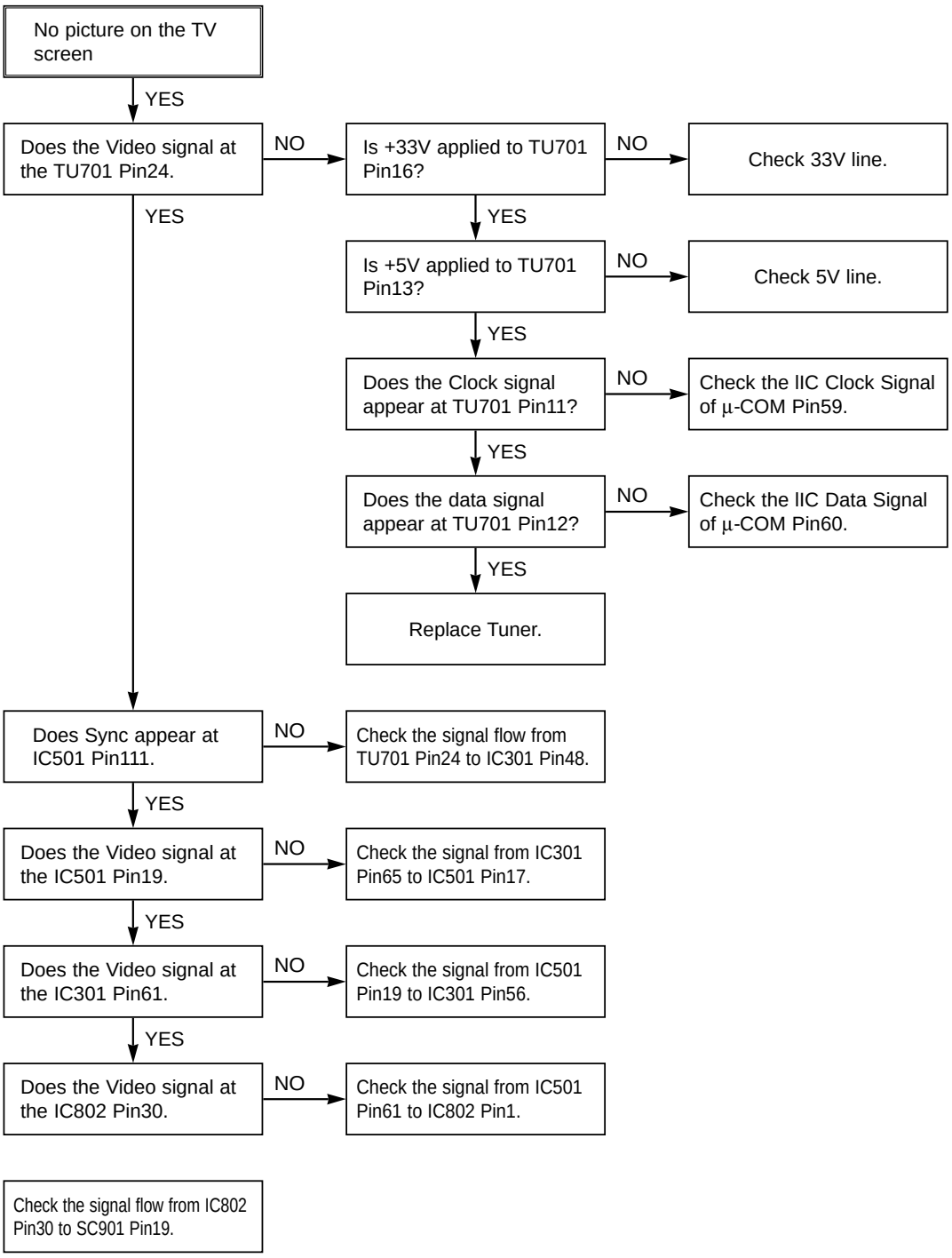


(C)

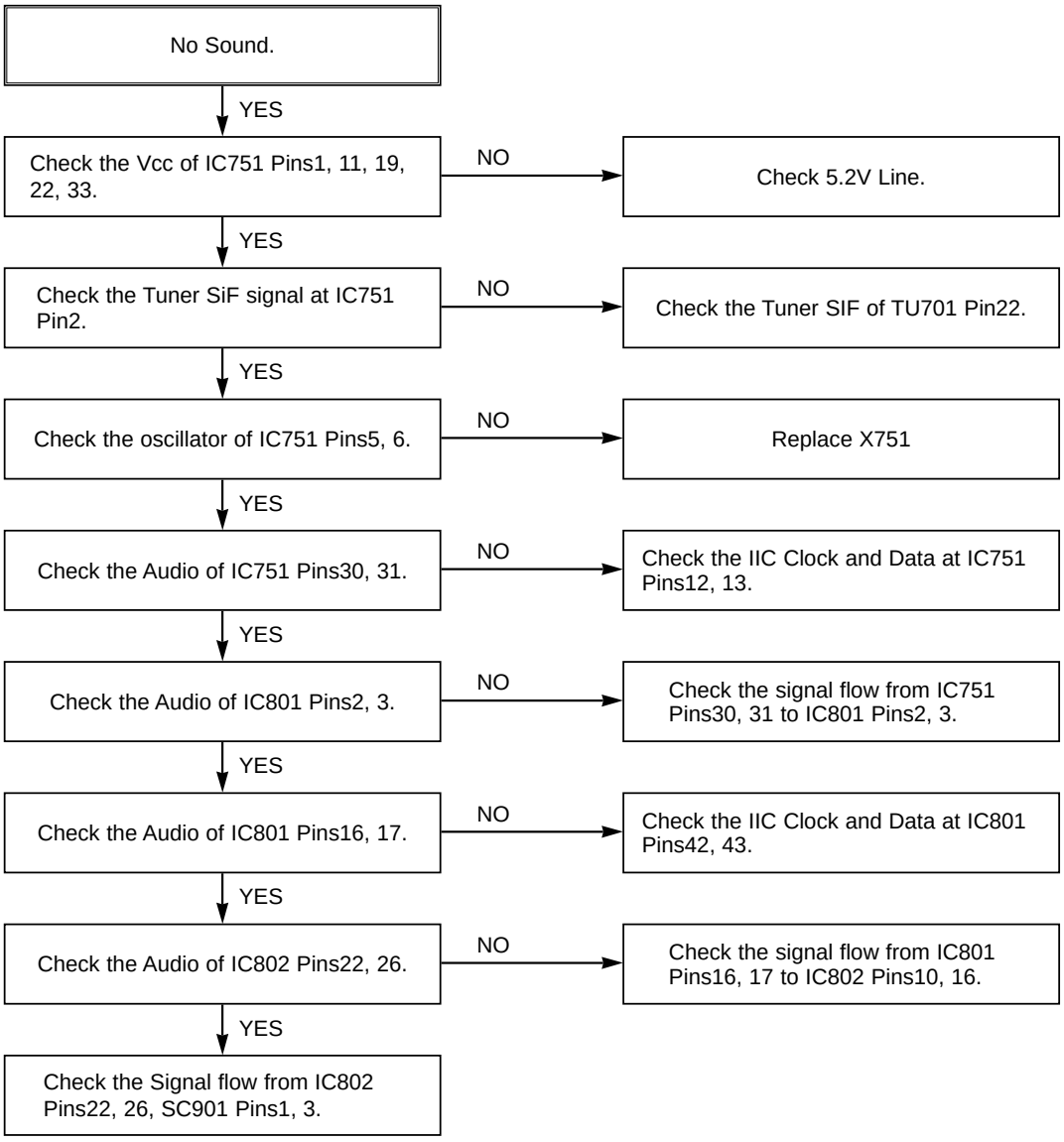

Hi-Fi REC.
YES
It is impossible to record Hi-Fi Audio signal.
YES
Check Vcc of IC801.(Pins34, 40)
NO
Check Power 5V, 12VT.
YES
Check IC801 Pin42(Data), Pin43(CLOCK).
NO
Check ports of μ-COM.
YES
Do Audio signals appear at IC801 Pins16, 17?
NO
Check Audio input signal of IC801 Pins2, 3(TU.A.), 4, 5(DVD.A.), 6, 7(AVI.A.), 8, 9(AV2.A.), 10, 11(AV3.A.).
YES
Do FM Audio signals appear at IC801 Pin36?
NO
Replace IC801.
YES
Check the Contact Point of Drum Connector if good then Replace the Drum.

6. Tuner/IF CIRCUIT

(A) No Picture on the TV screen

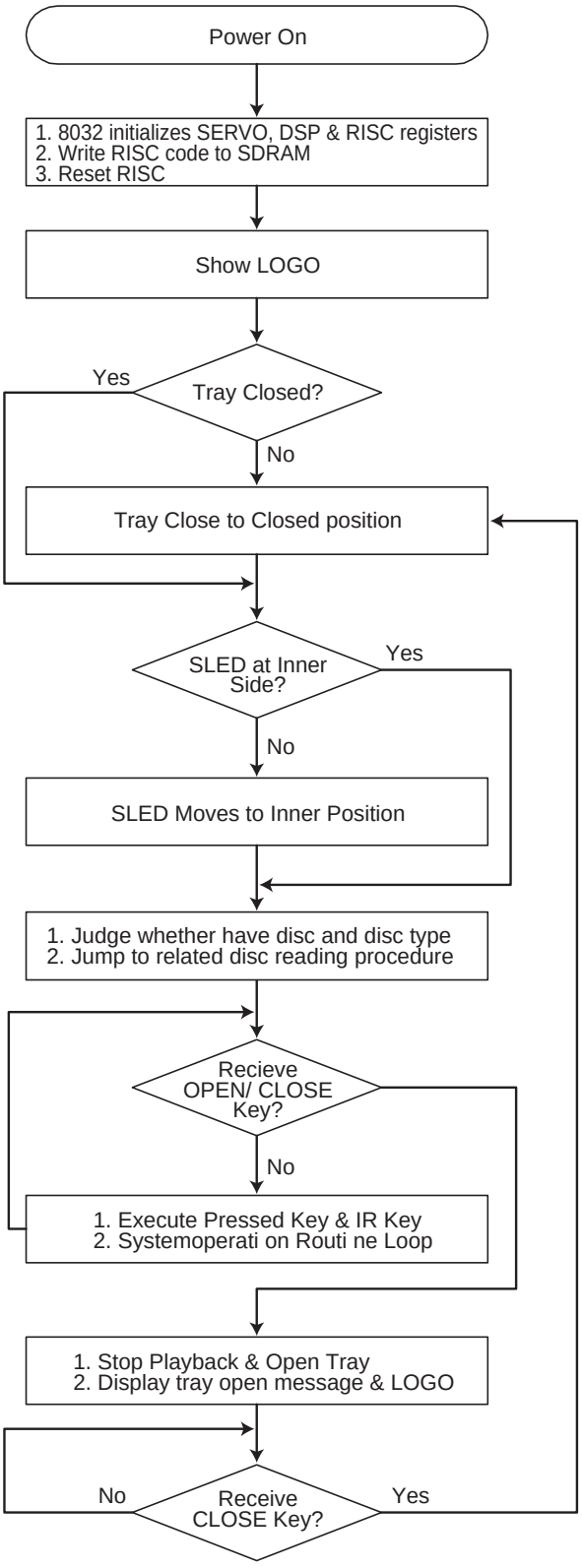

No picture on the TV screen
YES
Does the Video signal at the TU701 Pin24.
NO
Is +33V applied to TU701 Pin16?
NO
Check 33V line.
YES
YES
Is +5V applied to TU701 Pin13?
NO
Check 5V line.
YES
Does the Clock signal appear at TU701 Pin11?
NO
Check the IIC Clock Signal of µ-COM Pin59.
YES
Does the data signal appear at TU701 Pin12?
NO
Check the IIC Data Signal of µ-COM Pin60.
YES
Replace Tuner.
Does Sync appear at IC501 Pin111.
NO
Check the signal flow from TU701 Pin24 to IC301 Pin48.
YES
Does the Video signal at the IC501 Pin19.
NO
Check the signal from IC301 Pin65 to IC501 Pin17.
YES
Does the Video signal at the IC301 Pin61.
NO
Check the signal from IC501 Pin19 to IC301 Pin56.
YES
Does the Video signal at the IC802 Pin30.
NO
Check the signal from IC501 Pin61 to IC802 Pin1.
Check the signal flow from IC802 Pin30 to SC901 Pin19.

(B) No Sound

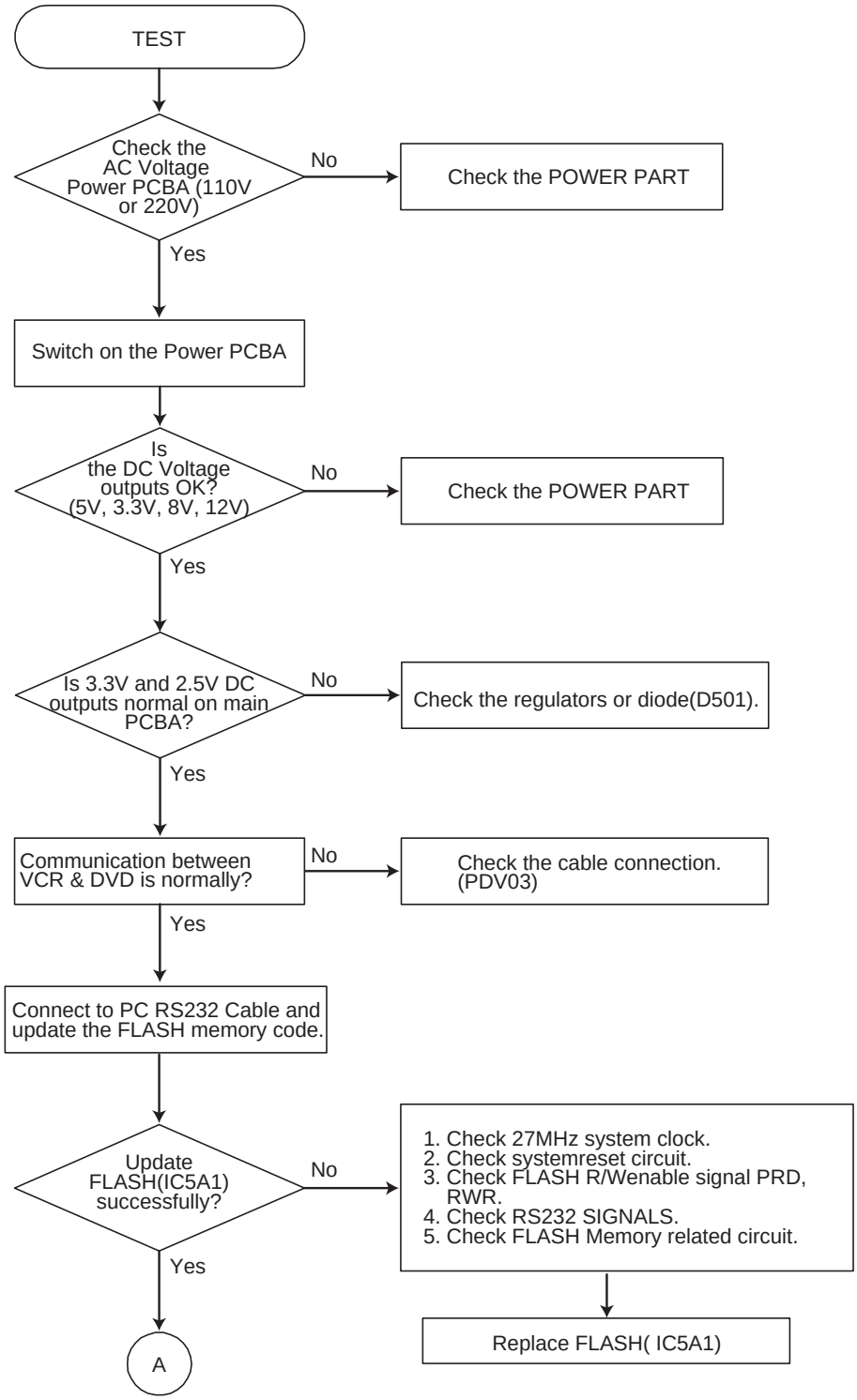

No Sound.
YES
Check the Vcc of IC751 Pins1, 11, 19, 22, 33.
NO
Check 5.2V Line.
YES
Check the Tuner SiF signal at IC751 Pin2.
NO
Check the Tuner SIF of TU701 Pin22.
YES
Check the oscillator of IC751 Pins5, 6.
NO
Replace X751
YES
Check the Audio of IC751 Pins30, 31.
NO
Check the IIC Clock and Data at IC751 Pins12, 13.
YES
Check the Audio of IC801 Pins2, 3.
NO
Check the signal flow from IC751 Pins30, 31 to IC801 Pins2, 3.
YES
Check the Audio of IC801 Pins16, 17.
NO
Check the IIC Clock and Data at IC801 Pins42, 43.
YES
Check the Audio of IC802 Pins22, 26.
NO
Check the signal flow from IC801 Pins16, 17 to IC802 Pins10, 16.
YES
Check the Signal flow from IC802 Pins22, 26, SC901 Pins1, 3.

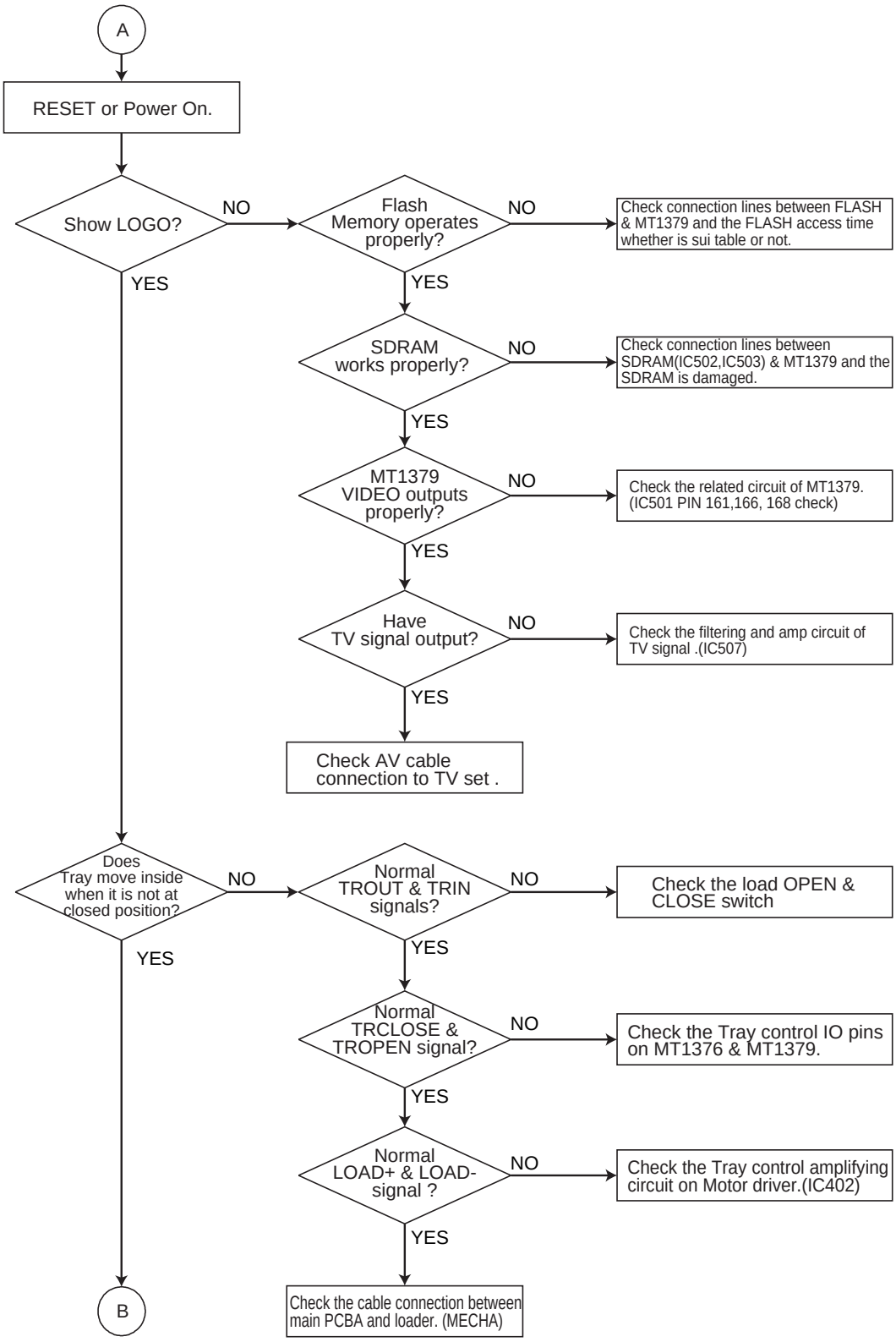
3-3. DVD & AMP SECTION ELECTRICAL TROUBLESHOOTING GUIDE

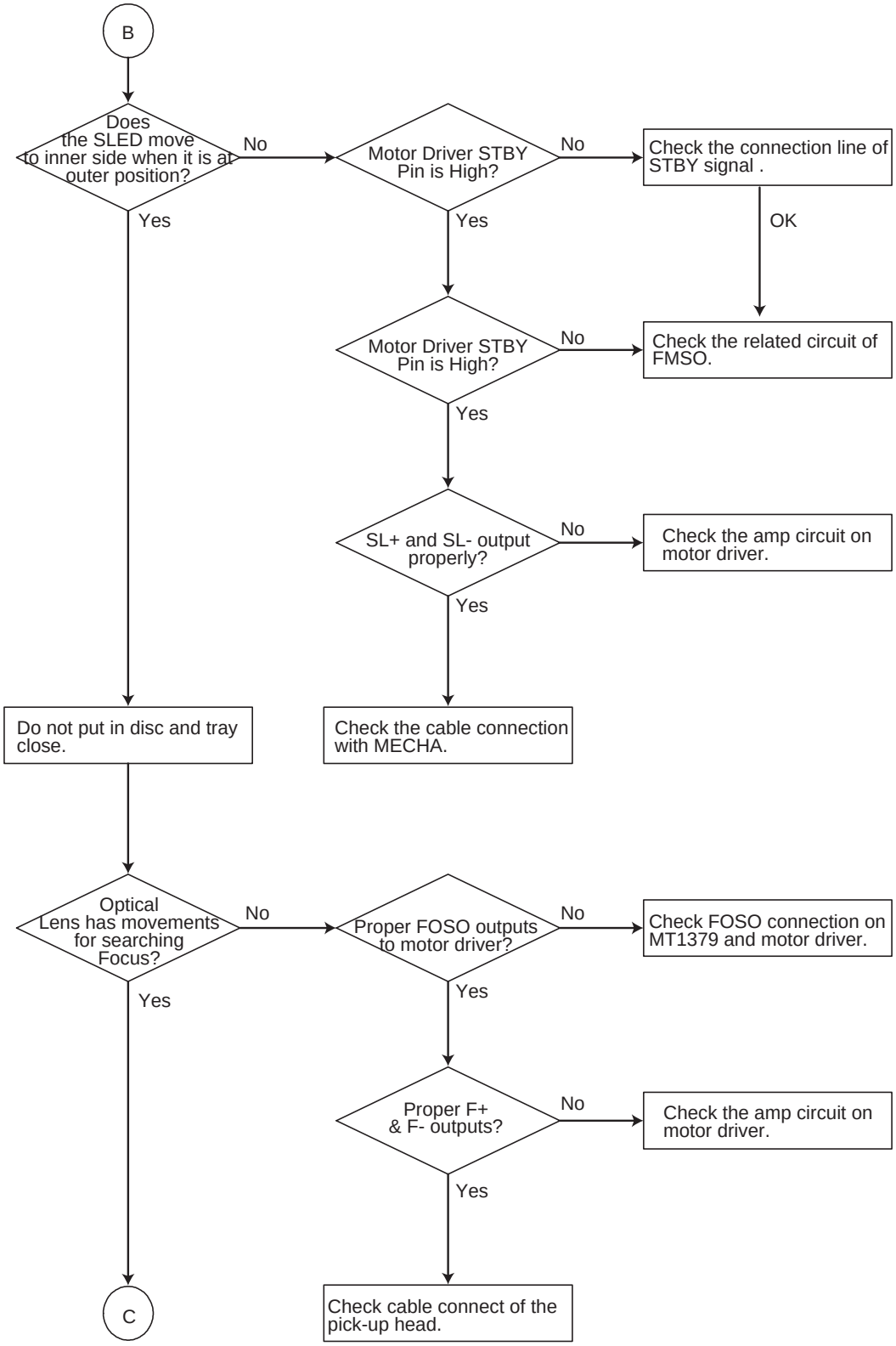
1. System operation flow

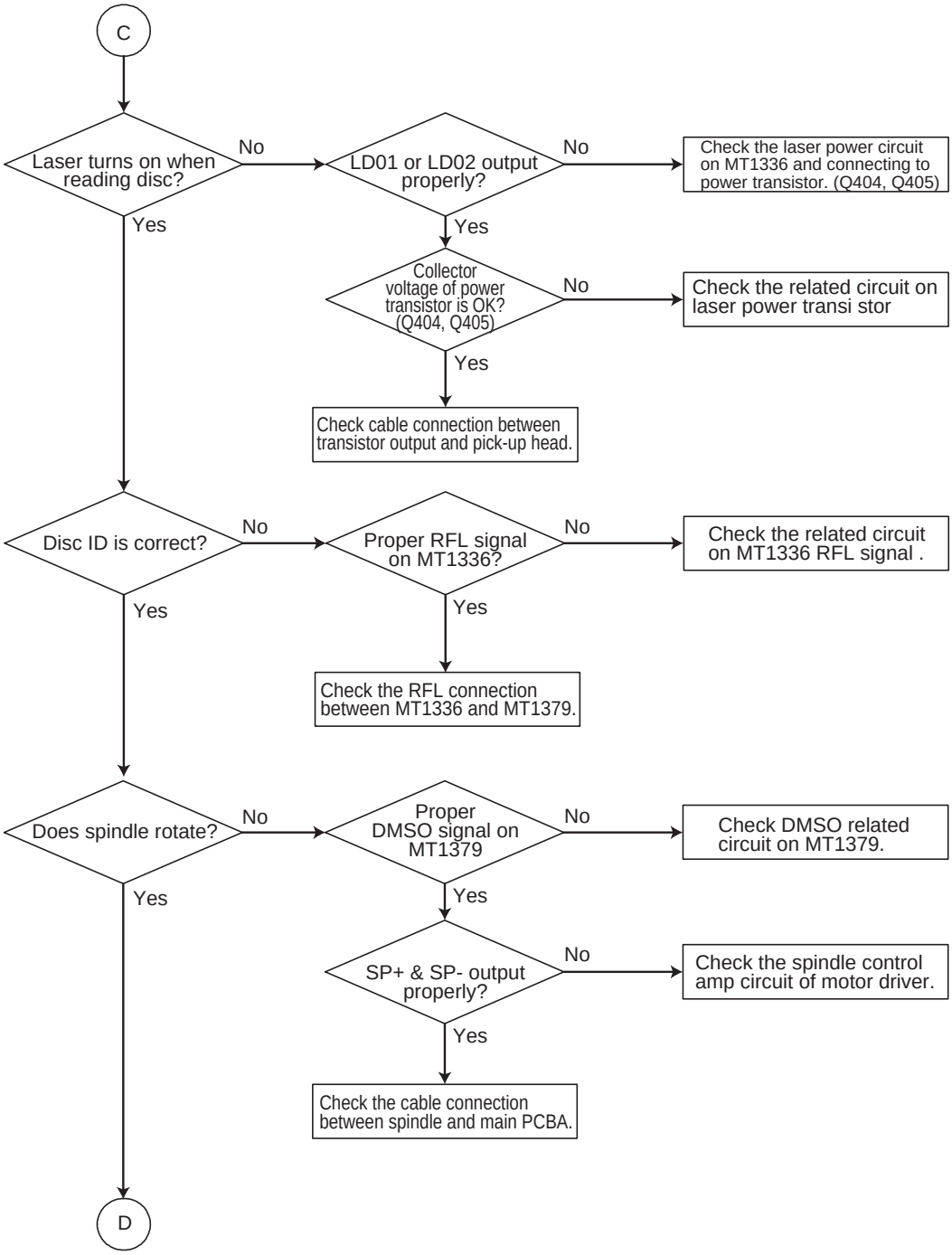


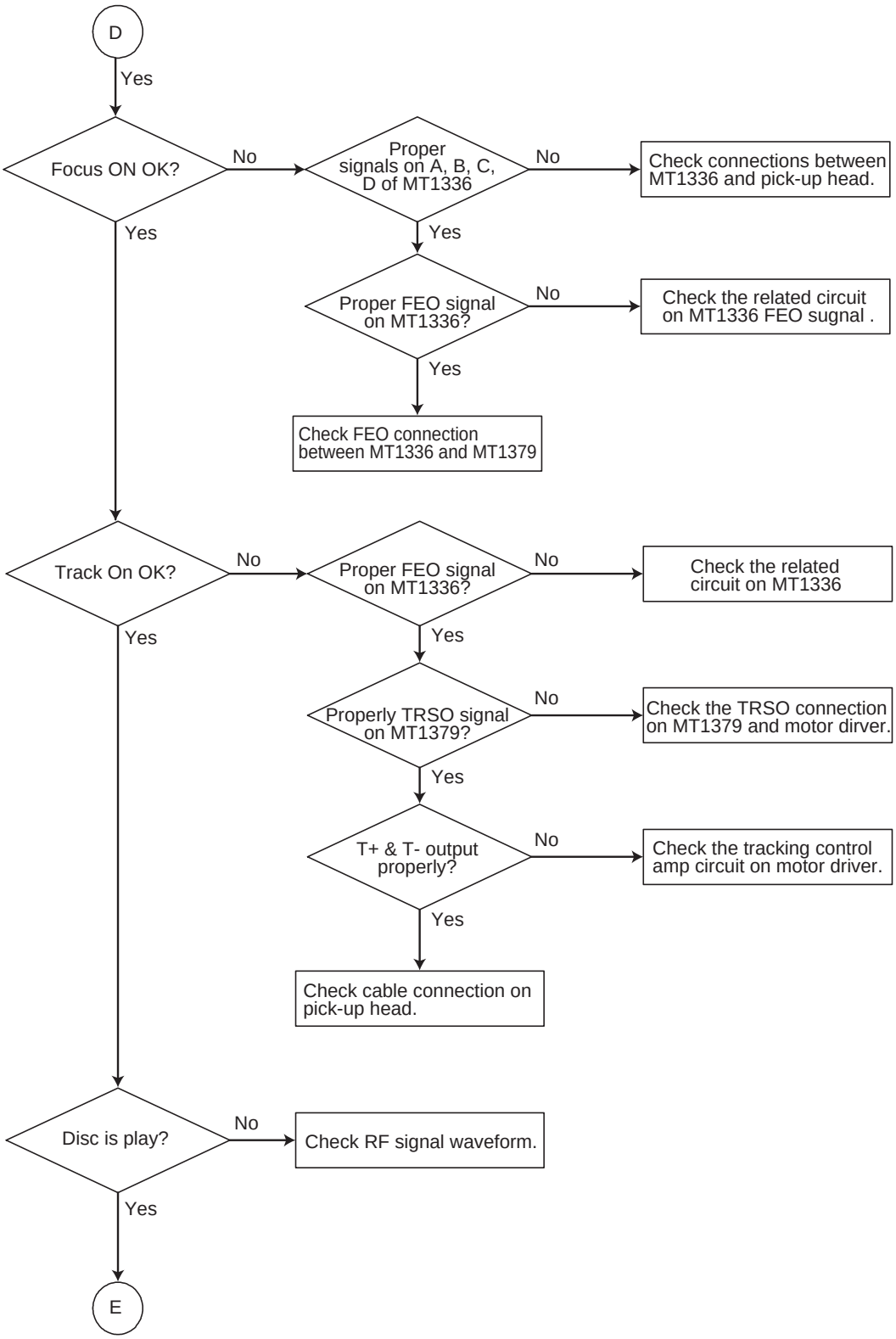
2. Test & debug flow

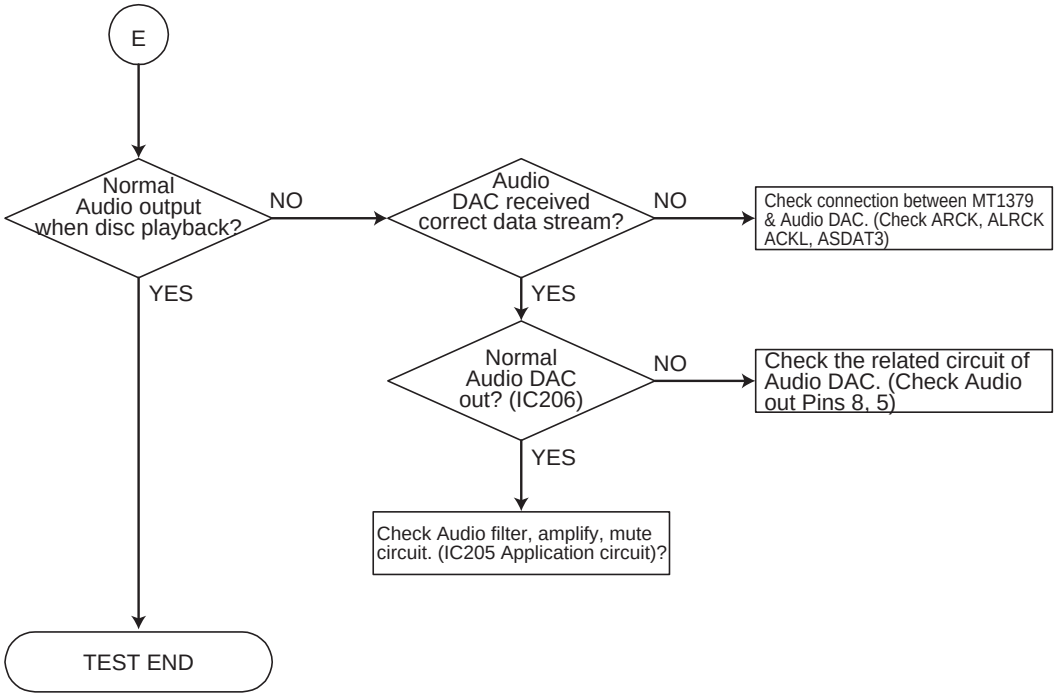



A
RESET or Power On.
Show LOGO?
NO
YES
Flash Memory operates properly?
NO
Check connection lines between FLASH & MT1379 and the FLASH access time whether is sui table or not.
YES
SDRAM works properly?
NO
Check connection lines between SDRAM(IC502,IC503) & MT1379 and the SDRAM is damaged.
YES
MT1379 VIDEO outputs properly?
NO
Check the related circuit of MT1379. (IC501 PIN 161,166, 168 check)
YES
Have TV signal output?
NO
Check the filtering and amp circuit of TV signal .(IC507)
YES
Check AV cable connection to TV set .
Does Tray move inside when it is not at closed position?
NO
YES
Normal TROUT & TRIN signals?
NO
Check the load OPEN & CLOSE switch
YES
Normal TRCLOSE & TROPEN signal?
NO
Check the Tray control IO pins on MT1376 & MT1379.
YES
Normal LOAD+ & LOAD- signal ?
NO
Check the Tray control amplifying circuit on Motor driver.(IC402)
YES
Check the cable connection between main PCBA and loader. (MECHA)
B

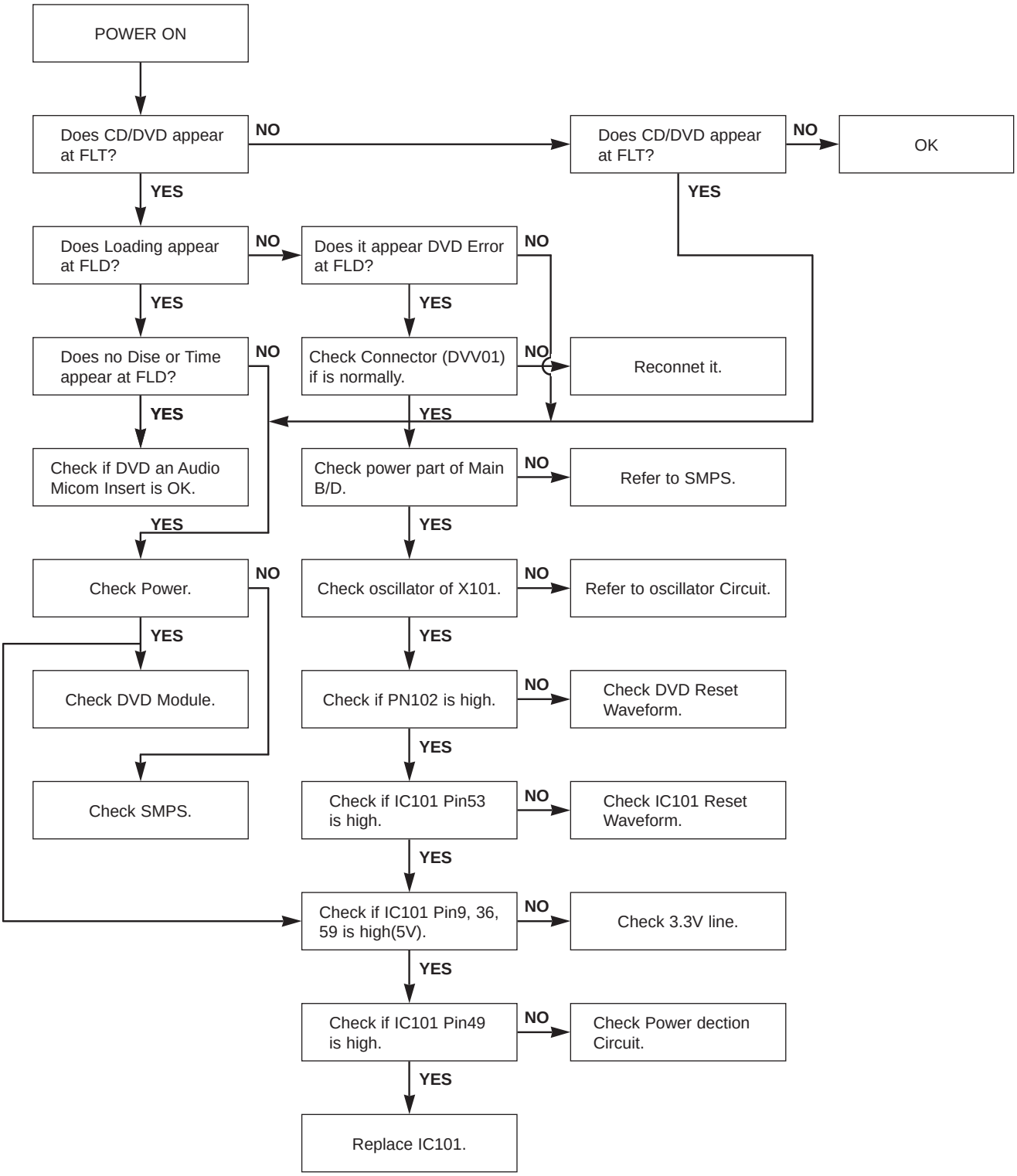

B
Does the SLED move to inner side when it is at outer position?
No
Yes
Motor Driver STBY Pin is High?
No
Yes
Check the connection line of STBY signal .
OK
Motor Driver STBY Pin is High?
No
Yes
Check the related circuit of FMSO.
SL+ and SL- output properly?
No
Yes
Check the amp circuit on motor driver.
Do not put in disc and tray close.
Check the cable connection with MECHA.
Optical Lens has movements for searching Focus?
No
Yes
Proper FOSO outputs to motor driver?
No
Yes
Check FOSO connection on MT1379 and motor driver.
Proper F+ & F- outputs?
No
Yes
Check the amp circuit on motor driver.
C
Check cable connect of the pick-up head.


C
Laser turns on when reading disc?
No
LD01 or LD02 output properly?
No
Check the laser power circuit on MT1336 and connecting to power transistor. (Q404, Q405)
Yes
Yes
Collector voltage of power transistor is OK? (Q404, Q405)
No
Check the related circuit on laser power transi stor
Yes
Check cable connection between transistor output and pick-up head.
Disc ID is correct?
No
Proper RFL signal on MT1336?
No
Check the related circuit on MT1336 RFL signal .
Yes
Yes
Check the RFL connection between MT1336 and MT1379.
Does spindle rotate?
No
Proper DMSO signal on MT1379
No
Check DMSO related circuit on MT1379.
Yes
Yes
SP+ & SP- output properly?
No
Check the spindle control amp circuit of motor driver.
Yes
Check the cable connection between spindle and main PCBA.
D


D
Yes
Focus ON OK?
No
Proper signals on A, B, C, D of MT1336
No
Check connections between MT1336 and pick-up head.
Yes
Yes
Proper FEO signal on MT1336?
No
Check the related circuit on MT1336 FEO sugnal .
Yes
Check FEO connection between MT1336 and MT1379
Track On OK?
No
Proper FEO signal on MT1336?
No
Check the related circuit on MT1336
Yes
Yes
Properly TRSO signal on MT1379?
No
Check the TRSO connection on MT1379 and motor dirver.
Yes
T+ & T- output properly?
No
Check the tracking control amp circuit on motor driver.
Yes
Check cable connection on pick-up head.
Disc is play?
No
Check RF signal waveform.
Yes
E

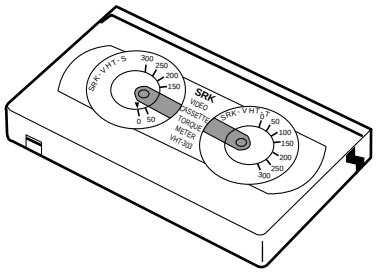
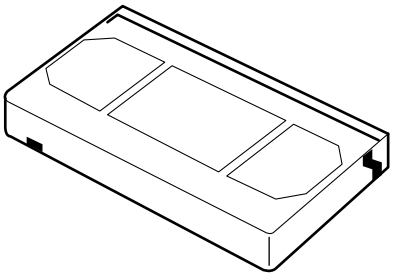
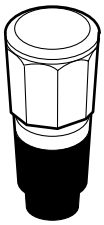
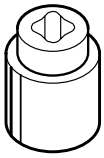
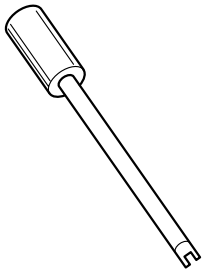
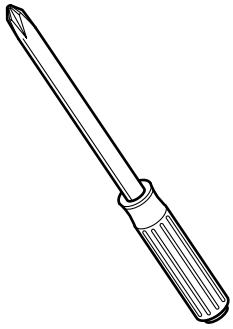

E
Normal Audio output when disc playback?
NO
Audio DAC received correct data stream?
NO
Check connection between MT1379 & Audio DAC. (Check ARCK, ALRCK ACKL, ASDAT3)
YES
YES
Normal Audio DAC out? (IC206)
NO
Check the related circuit of Audio DAC. (Check Audio out Pins 8, 5)
YES
Check Audio filter, amplify, mute circuit. (IC205 Application circuit)?
TEST END

3. AUDIO μ-COM Circuit(DVD & AMP)



SECTION 4
MECHANICAL ADJUSTMENTS

• Tools and Fixfures for Service

1. Cassette Torque meter SRK-VHT-303(Not SVC part) 	2. Alignment tape (See figure below) 	3. Torque gauge 600g.Cm ATG 
4. Torque gauge adaptor 	5. Post height adjusting driver Parts No. : SV-TGO-030-000(SMALL) : SV-TGO-030-000(LARGE) 	6. + Type driver (ϕ 5) 

• Alignment Tapes for Adjustment

Derivation No.			A	B C	D
Mechanism / Adjustment Items			A	B C	D
		SP/LP 2/4 Head	SP 2 Head	SP/LP/EP 2/4 Head	SP 2 Head
FM Envelope		TTV-P2L	TTV-P2	TTV-N1 (TTV-N12)	TTV-N2
A/C Head	Slantness	A commecially available tape			
	Height	TTV-P1 (TTV-P1L)	TTV-P1	TTV-N1 (TTV-N12) (TTV-N1E)	TTV-N1 (TTV-N12)
	Azimuth	TTV-P1	TTV-P2	TTV-N2	TTV-N2
X-value		TTV-P2 (TTV-P2L)	TTV-P2	TTV-N2 TTV-N2E TTV-N12	TTV-N2
RG Post Inclination		A commecially available tape			
Tape Back Tension		SRK-VHT-303			

The numbers in ( ) parenthesis can be used as the substiture.

1. Mechanism Alignment Position Check

Purpose:To determine if the Mechanism is in the correct position, when a Tape is ejected.

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Check Point
• Blank tape	• Eject Mode (with Cassette ejected)	• Mechanism and Mode Switch Position

1) Turn the Power S/W on and eject the Cassette by pressing the Eject Button.
2) Remove the Top Cover and Plate Assembly Top, visually check if the Gear Cam Hole is aligned with the Chassis Hole as below Fig. C-2.
3) IF not, rotate the Shaft of the Loading Motor to either clockwise or counterclockwise until the alignment is as below Fig. C-2.
4) Remove the Screw which fixes the Deck Mechanism and Main Frame and confirm if the Gear Cam is aligned with the Gear Drive as below Fig. C-1(A).
5) Confirm if the Mode S/W on the Main P.C.Board is aligned as below Fig. C-1(B).
6) Remount the Deck Mechanism on the Main P.C.Board and check each operation.

CHECK DIAGRAM

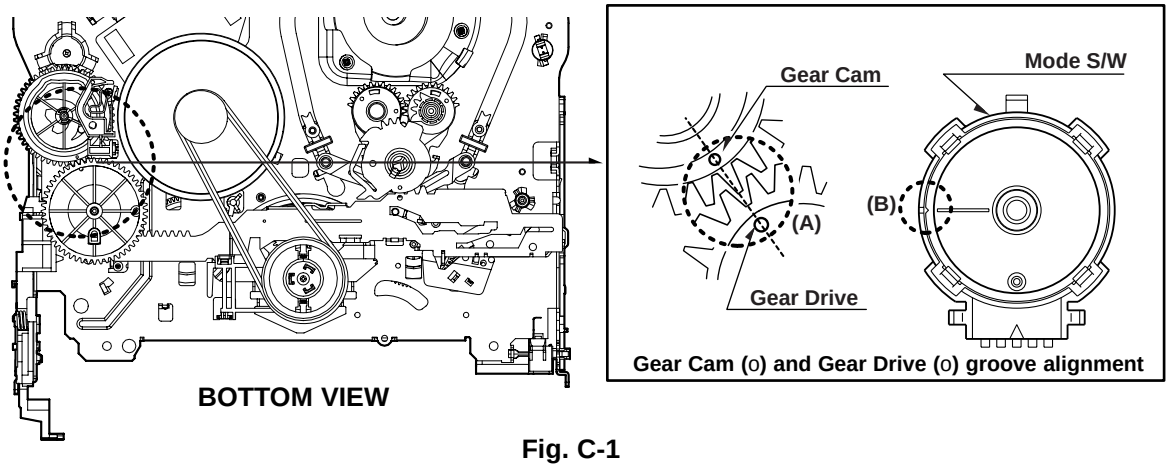


Fig. C-1

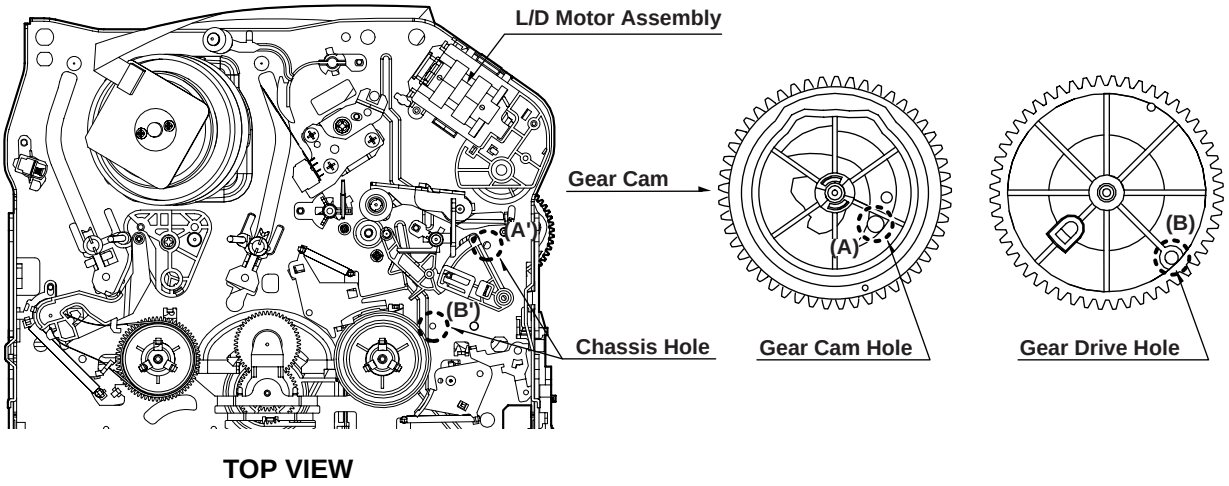


Fig. C-2

2. Preparation for Adjustment (To set the Deck Mechanism of the loading state without inserting a cassette tape).

1) Unplug the power cord from the AC outlet.
2) Disassemble the Top Cover and Plate Assembly Top.
3) Plug the power cord into the AC outlet.
4) Turn the power S/W on and push the Lever Stopper of the Holder Assembly CST to the back for loading the cassette without tape.
Cover the holes of the End Sensors at the both sides of the Chassis to prevent a light leak.
Then the Deck Mechanism drives to the Stop Mode.
In this case, the Deck Mechanism can accept inputs of each mode, however the Rewind and Review operation can not be performed for more than a few seconds because the Take-up Reel Table is in the Stop State and can not be detected the Reel Pulses.

3. Checking Torque

Purpose: To insure smooth transport of the tape during each mode of operation.
If the tape transport is abnormal, then check the torque as indicated by the chart below.

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Checking Method
• Torque Gauge(600g/cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter SRK-VHT-303	• Play (FF) or Review (REW) Mode	• Perform each Deck Mechanism mode without inserting a cassette tape(Refer to above No.2 Preparation for Adjustment). • Read the measurement of the Take-up or Supply Reels on the Cassette Torque Meter(Fig. C-3-2). • Attach the Torque Gauge Adaptor to the Torque Gauge and then read the value of it(Fig. C-3-1).

Item	Mode	Test Equipment	Measurement Reel	Measurement Values
Fast Forward Torque	Fast Forward	Cassette Torque Gauge	Take-Up Reel	More than 400g/cm
Rewind Torque	Rewind	Cassette Torque Gauge	Supply Reel	More than 400g/cm
Play Take-Up Torque	Play	Cassette Torque Meter	Take-Up Reel	40~100g/cm
Review Torque	Review	Cassette Torque Meter	Supply Reel	120~210g/cm

NOTE:

The values are measured by using a Torque Gauge and Torque Gauge Adaptor with the Torque Gauge affixed.

NOTE:

The torque reading to measure occurs when the tape abruptly changes direction from Fast Forward to Rewind Mode, when quick braking is applied to both Reels.

• Torque Gauge (600g.cm ATG)

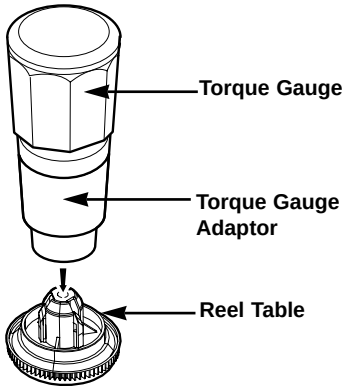


Fig. C-3-1

• Cassette Torque Meter (SRK-VHT-303)

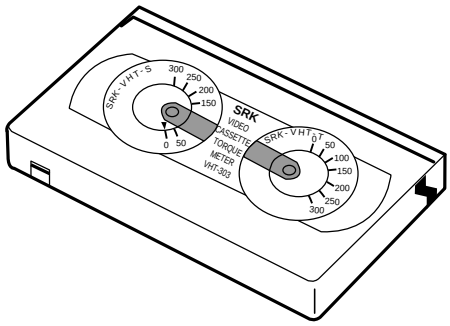


Fig. C-3-2

4.Guide Roller Height Adjustment

Purpose: To regulate the height of the tape so that the bottom of the tape runs along the tape guide line on the Lower Drum.

4-1. Preliminary Adjustment

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Adjustment Point
• Post Height Adjusting Driver	• Play or Review Mode	• Guide Roller Height Adjustment screws on the Supply and Take-Up Guide Rollers.

Adjustment Procedure

1) Confirm if the tape runs along the tape guide line of the Lower Drum.
2) If the tape runs the bottom of the guide line, turn the Guide Roller Height Adjustment Screw to clockwise direction.
3) If it runs the top, turn to counterclockwise direction.
4) Adjust the height of the Guide Roller to be guided to the guide line of the Lower Drum from the starting and ending point of the Drum.

ADJUSTMENT DIAGRAM

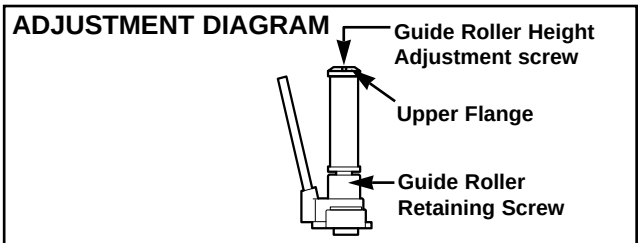


Fig. C-4-1

4-2. Precise Adjustment

Test Equipment/Fixture	Test Equipment Connection Points	Test Conditions VCR(VCP) State	Adjustment Point
• Oscilloscope • Alignment Tape • Post Height Adjusting Driver	• CH-1:PB RF Envelope • CH-2:NTSC: SW 30Hz PAL: SW 25Hz • Head Switching Output Point • RF Envelope Output Point	• Play an Alignment Tape	• Guide Roller Height Adjustment Screws

Adjustment Procedure

1) Play an Alignment Tape after connecting the probe of the Oscilloscope to the RF Envelope Output Test Point and Head Switching Output Test Point.
2) Tracking Control(in PB Mode) : Center Position(When this adjustment is performed after the Drum Assembly has been replaced, set the Tracking Control so that the RF Output is Maximum).
3) Height Adjustment Screw : Flatten the RF waveform. (Fig. C-4-2)
4) Turn(Move) the Tracking Control(in PB Mode) clockwise and counterclockwise.(Fig. C-4-3)
5) Check that any drop of RF Output is uniform at the start and end of the waveform.

NOTE

If the adjustment is excessive or insufficient the tape will jam or fold.

Waveform Diagrams

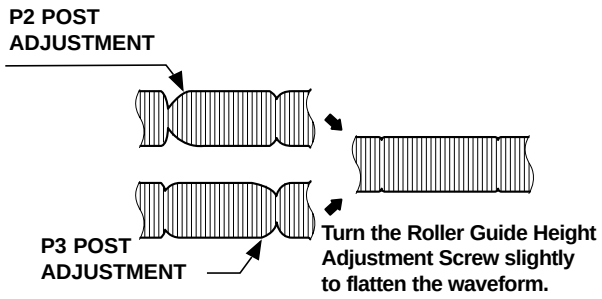


Fig. C-4-2

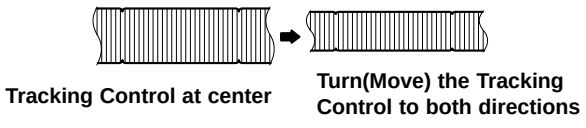
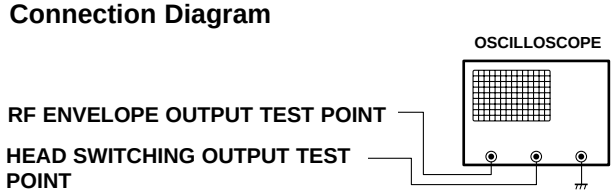


Fig. C-4-3

Connection Diagram



5. Audio/Control (A/C) Head Adjustment

Purpose: To insure that the tape passes accurately over the Audio and Control Tracks in exact alignment of the both Record and Playback Modes.

5-1. Preliminary Adjustment (Height and Tilt Adjustment)
Perform the Preliminary Adjustment, when there is no Audio Output Signal with the Alignment Tape.

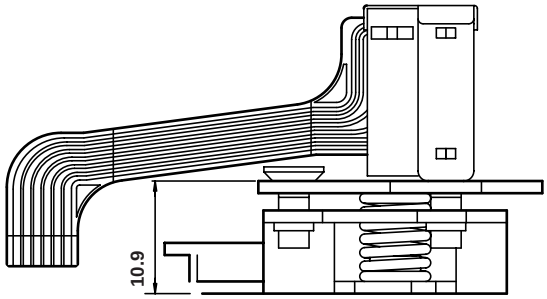
Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Adjustment Point
• Blank Tape • Screw Driver(+) Type 5mm	• Play the blank tape	• Tilt Adjustment Screw(C) • Height Adjustment Screw(B) • Azimuth Adjustment Screw(A)

Adjustment Procedure/Diagrams

1) Initially adjust the Base Assembly A/C Head as shown Fig. C-5-1 by using the Height Adjustment Screw(B).
2) Play a blank tape and observe if the tape passes accurately over the A/C Head without tape curling or folding.
3) If folding or curling is occured then adjust the Tilt Adjustment Screw(C) while the tape is running to resemble Fig. C-5-3.
4) Reconfirm the tape path after Playback about 4~5 seconds.

NOTE

Ideal A/C head height occurs when the tape runs between 0.2~0.25mm above the bottom edge of the A/C Head core.



A/C Head Base

Fig. C-5-1

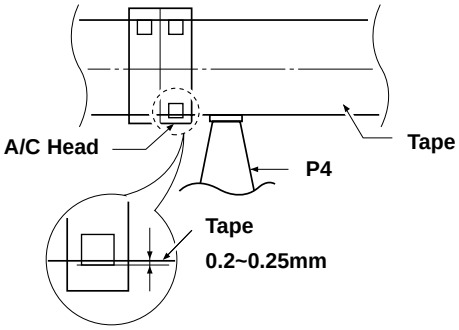
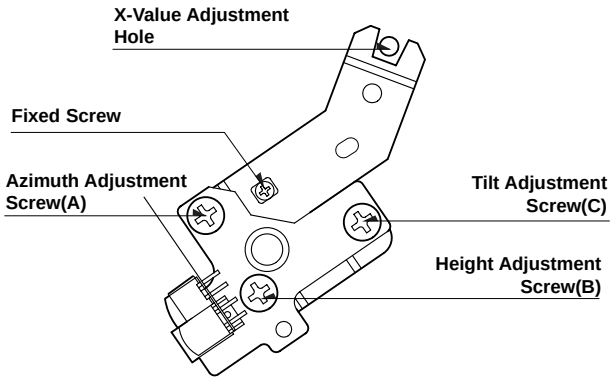


Fig. C-5-3



A/C Head Assembly

Fig. C-5-2

5-2. Confirm that the tape passes smoothly between the Take-up Guide and Pinch Roller(using a mirror or the naked eye).

1) After completing Step 5-1.(Preliminary Adjustment), check that the tape passes around the Take-up Guide and Pinch Roller without folding or curling at the top or bottom.
   (1) If folding or curling is observed at the bottom of the Take-up Guide then slowly turn the Tilt Adjustment Screw(C) in the clockwise direction.
   (2) If folding or curling is observed at the top of it then slowly turn the Tilt Adjustment Screw(C) in the counterclockwise direction.

NOTE:

Check the RF envelope after adjusting the A/C Head, if the RF waveform differs from Fig. C-5-4, performs Precise Adjustment to flat the RF waveform.

5-3. Precise Adjustment (Azimuth adjustment)

Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Point
• Oscilloscope • Alignment Tape(SP) • Screw Driver(+) Type 5mm	• Audio output jack	• Play an Alignment Tape 1kHz, 7kHz Sections	• Azimuth Adjustment Screw(A) • Height Adjustment Screw(B)

Adjustment Procedure

1) Connect the probe of the oscilloscope to Audio Output Jack.
2) Alternately adjust the Azimuth Adjustment Screw(A) and the Tilt Adjustment Screw(C) for maximum output of the 1kHz and 7kHz segments, while maintaining the flattest envelope differential between the two frequencies.

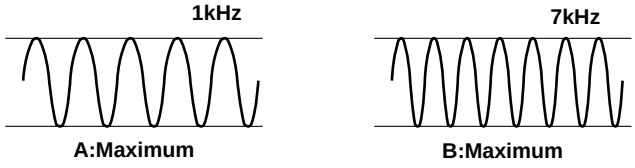
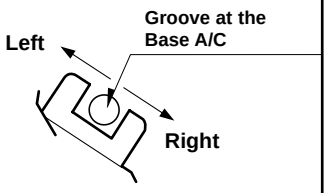


Fig. C-5-4

6. X-Value Adjustment

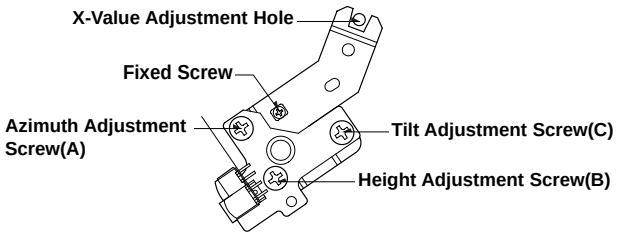
Purpose: To obtain compatibility with the other VCR(VCP) Models.

Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Point
• Oscilloscope • Alignment Tape(SP only) • Screw Driver(+) Type 5mm	• CH-1: PB RF Envelope • CH-2: NTSC: SW 30Hz PAL: SW 25Hz • Head Switching Output Test Point • RF Envelope Output Test Point	• Play an Alignment Tape	

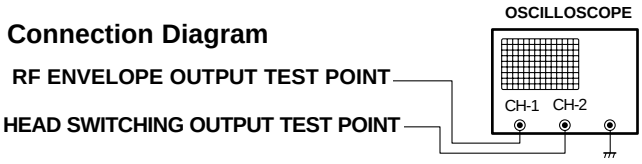
Adjustment Procedure

1) Release the Automatic Tracking to run long enough for tracking to complete it's cycle.
2) Loosen the Fixed Mounting Screw and move the Base Assembly A/C Head in the direction as shown in the diagram to find the center of the peak that allows for the maximum waveform envelope.
   This method should allow the 31μm Head to be centrally located over the 58μm tape track.
3) Tighten the Base Assembly A/C Head mounting Screw.

Adjustment Diagram



Connection Diagram



7. Adjustment after Replacing Drum Assembly (Video Heads)

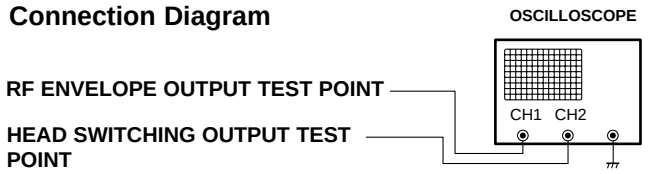
Purpose: To correct for shift in the Roller Guide and X value after replacing the Drum.

Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Points
• Oscilloscope • Alignment Tapes • Blank Tape • Post Height Adjusting Driver • Screw Driver(+) Type 5mm	• CH-1: PB RF Envelope • CH-2: NTSC: SW 30Hz PAL: SW 25Hz • Head Switching Output Test Point • RF Envelope Output Test Point	• Play the Blank Tape • Play an Alignment Tape	• Guide Roller Precise Adjustment • Switching Point • Tracking Preset • X-Value

Checking/Adjustment Procedure

Play a blank tape and check for tape curling or creasing around the Roller Guide. If there is a problem then follow the procedure 4. "Guide Roller Height" and 5. "Audio Control(A/C) Head Adjustment".

Connection Diagram



Waveform

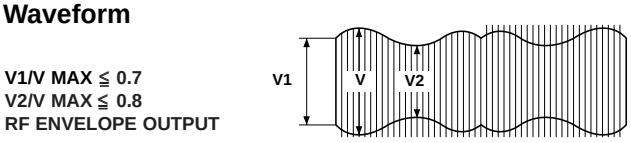


Fig. C-7

8. Check the Tape Travel after Reassembling Deck Assembly.

8-1. Checking Audio and RF Locking Time during playback and after CUE or REV (FF/REW)

Test Equipment/ Fixture	Specification	Connection Points	Test Conditions (Mechanism Condition)
• Oscilloscope • Alignment Tapes(with 6H 3KHz Color Bar Signal) • Stop Watch	• RF Locking Time: Less than 5 sec. • Audio Locking Time:Less than 10sec	• CH-1: PB RF Envelope • CH-2: Audio Output • RF Envelope Output Point • Audio Output Jack	• Play an Alignment Tape (with 6H 3kHz Color Bar Signal)

Checking Procedure

Play an Alignment Tape then change the operating mode to CUE or REV and confirm if the unit meets the above listed specifications.

NOTES:

1) CUE is the forward search mode (FF)
2) REV is the backward search mode (REW)
3) Refer to the Play mede

8-2. Checking for tape curling or jamming

Test Equipment/ Fixture	Specification	Test Conditions (Mechanism Condition)
• T-160 Tape • T-120 Tape	• Be sure there is no tape jamming or curling at the begining, middle or end of the tape.	• Run the CUE, REV, Play mode at the beginning and the end of the tape.

Checking Procedure

1) Confirm that the tape runs smoothly around the roller guides, Drum and A/C Head Assemblies while abruptly changing operating modes from Play to CUE or REV. This is to be checked at the begining, middle and end sections of the tape.
2) Confirm that the tape passes over the A/C Head Assembly as indicated by proper audio reproduction and proper tape counter performance.

1. Check before starting repairs

The following faults can be remedied by cleaning and oiling. Check the needed lubrication and the conditions of cleanliness in the unit.
Check with the customer to find out how often the unit is used, and then determine that the unit is ready for inspection and maintenance. Check the following parts.

Phenomenon	Inspection	Replacement
Color beats	Dirt on Full-Erase Head	○
Poor S/N, no color	Dirt on Video Head	○
Vertical or Horizontal jitter	Dirt on Video Head Dirt on tape transport system	○
Low volume, Sound distorted	Dirt on Audio/Control Head	○
Tape does not run. Tape is slack	Dirt on Pinch Roller	○
In Review and Unloading (off mode), the tape is rolled up loosely.	Clutch Assembly D35 torque reduced	○
	Cleaning Drum and transport system	Fig. C-9-3

NOTE

If locations marked with ○ do not operate normally after cleaning, check for wear and replace.
See the EXPLODED VIEWS at the end of this manual as well as the above illustrations and see the Greasing (Page 45, 46) for the sections to be lubricated and greased.

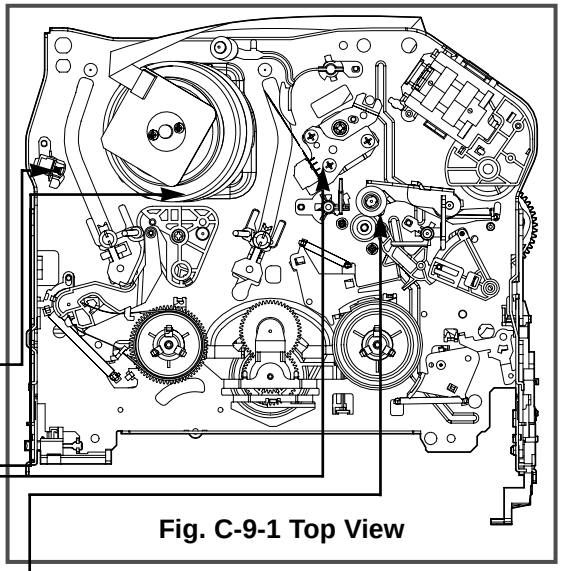


Fig. C-9-1 Top View

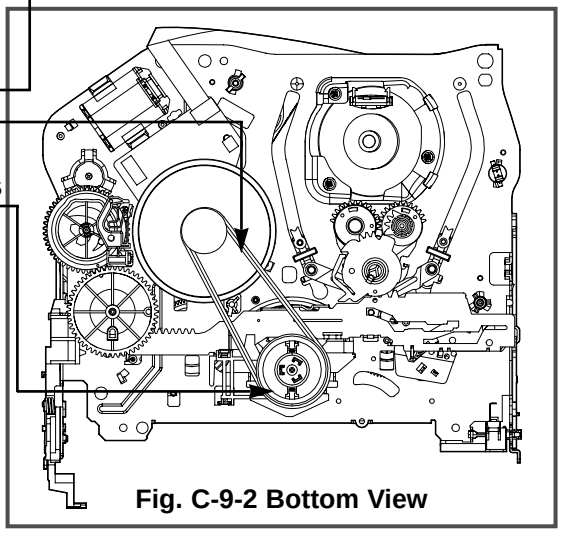


Fig. C-9-2 Bottom View

*** No. (1)~(12) Indicates the Tape Path to be traveled from Supply Reel to Take-up Reel.**

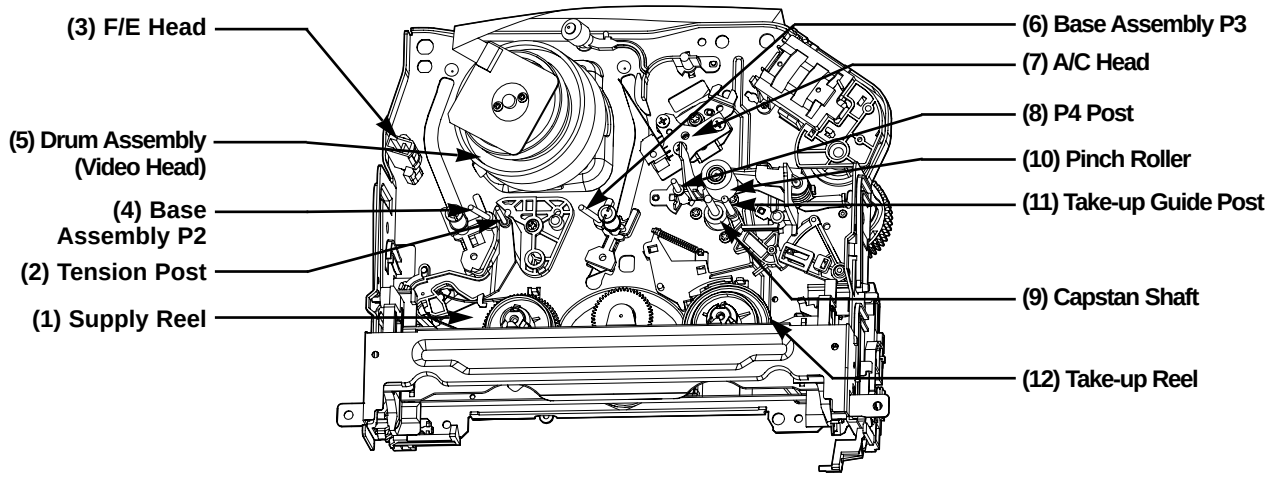


Fig. C-9-3 Tape Transport System

2. Required Maintenance

The recording density of a VCR(VCP) is much higher than that of an audio tape recorder. VCR(VCP) components must be very precise, at tolerances of 1/1000mm, to ensure compatibility with the other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure a good picture, periodic inspection and maintenance, including replacement of worn out parts and lubrication, is necessary.

3. Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR(VCP), and the environment in which the VCR(VCP) is used.
But, in general home use, a good picture will be maintained if inspection and maintenance is made every 1,000 hours. The table below shows the relation between time used and inspection period.

Table 1

When inspection is necessary / Average hours used per day	About 1 year	About 18 months	About 3 years
One hour	■	■	■
Two hours	■	■	
Three hours	■		

4. Supplies Required for Inspection and Maintence

(1) Grease : Kanto G-311G (Blue) or equivalent
(2) Isopropyl Alcohol or equivalent
(3) Cleaning Patches
(4) Grease : Kanto G-381(Yellow)

5. Maintenance Procedure

5-1) Cleaning

(1) Cleaning video head
First use a cleaning tape. If the dirt on the head is too stubborn to remove by tape, use the cleaning patch. Coat the cleaning patch with Isopropyl Alcohol. Touch the cleaning patch to the head tip and gently turn the head(rotating cylinder) right and left.
(Do not move the cleaning patch vertically. Make sure that only the buckskin on the cleaning patch comes into contact with the head. Otherwise, the head may be damaged.)
Thoroughly dry the head. Then run the test tape. If Isopropyl Alcohol remains on the video head, the tape may be damaged when it comes into contact with the head surface.
(2) Clean the tape transport system and drive system, etc, by wiping with a cleaning patch wetted with Isopropyl Alcohol.

NOTES:

① It is the tape transport system which comes into contact with the running tape. The drive system consists of those parts which moves the tape.
② Make sure that during cleaning you do not touch the tape transport system with excessive force that would cause deformation or damage to the system.

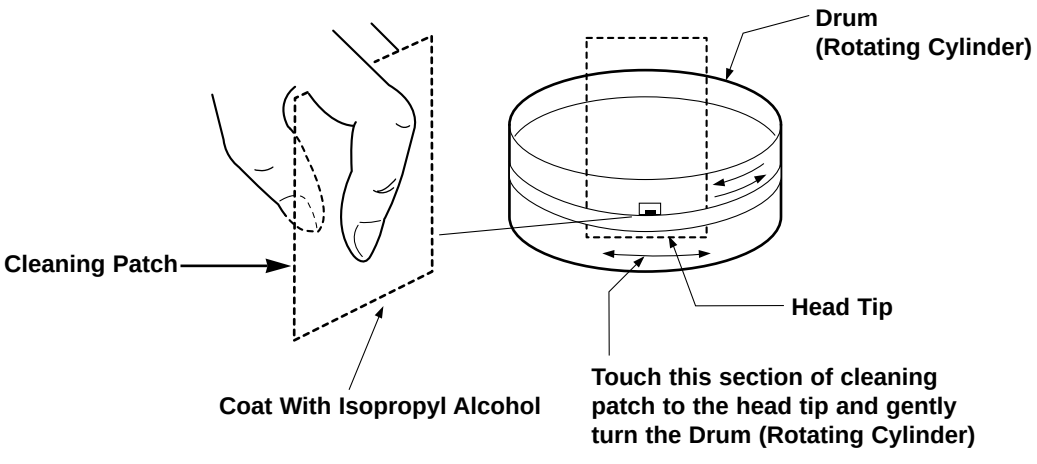

Drum
(Rotating Cylinder)
Cleaning Patch
Head Tip
Coat With Isopropyl Alcohol
Touch this section of cleaning patch to the head tip and gently turn the Drum (Rotating Cylinder)

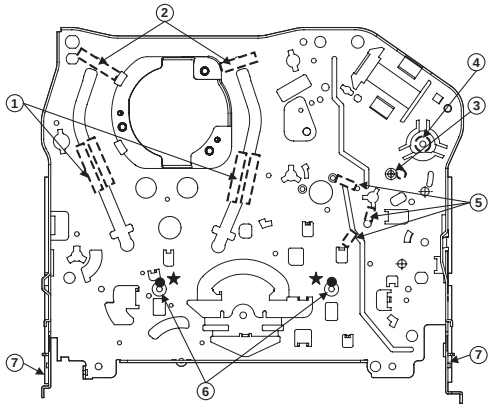
Fig. C-9-4

5-2) Greasing

(1) Greasing guidelines
Apply grease, with a cleaning patch. Do not use excessive grease. It may come into contact with the tape transport or drive system. Wipe excessive grease and clean with cleaning patch wetted in Isopropyl Alcohol.

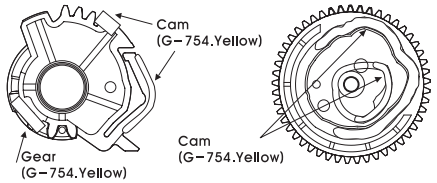
NOTE:Greasing Points

1) Loading Path Inside & Top side
2) Base Assembly P2, P3 stopper
3) Shaft
4) L/D Motor Gear Wheel Part
5) Arm Take-up Rubbing Sections
6)Reel S,T shaft(G381:Yellow)
7) Arm Assembly F/L Rotating Sections

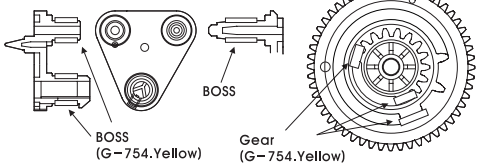


Chassis (Top)

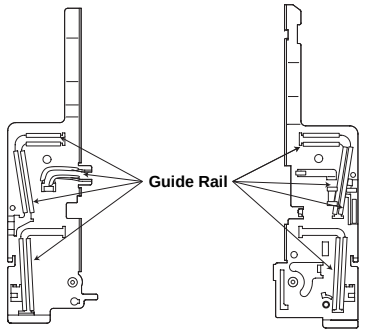
Gear Part



Gear Sector **Gear Cam**



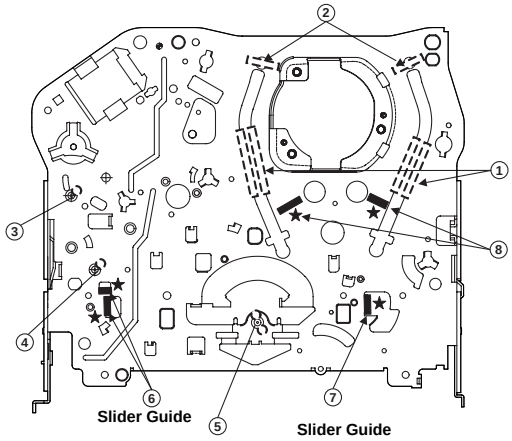
Base Loading **Gear Drive**



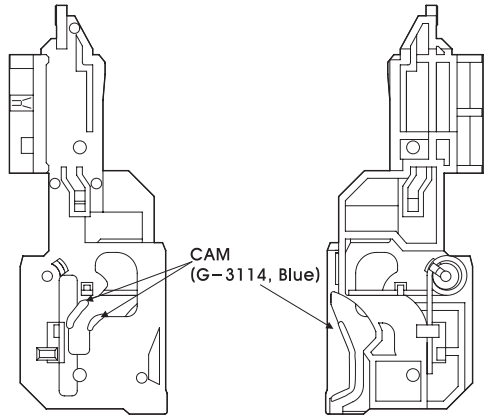
Chassis (Left Side) **Chassis (Right Side)**

(2) Periodic greasing
Grease specified locations every 5,000 hours.

1) Loading Path Inside & Top side
2) Base Assembly P2,P3 stopper
3) Shaft
4) Shaft
5) Clutch Assembly D35 Shaft
6) Plate Slider Guide Sections
7) Plate Slider Guide Sections
8) Gear Assembly P2, P2 Rubbing Sections



Chassis (Bottom)



Gear Rack F/L

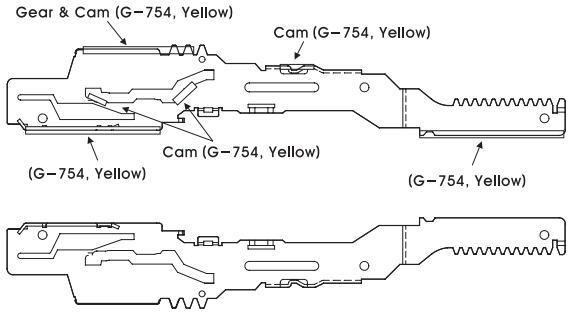
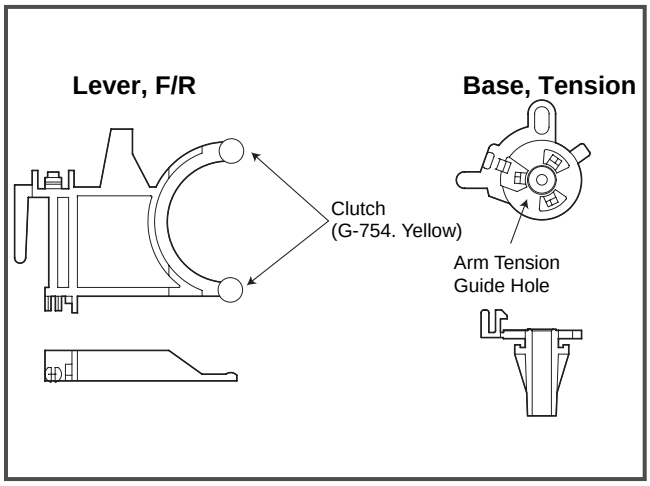
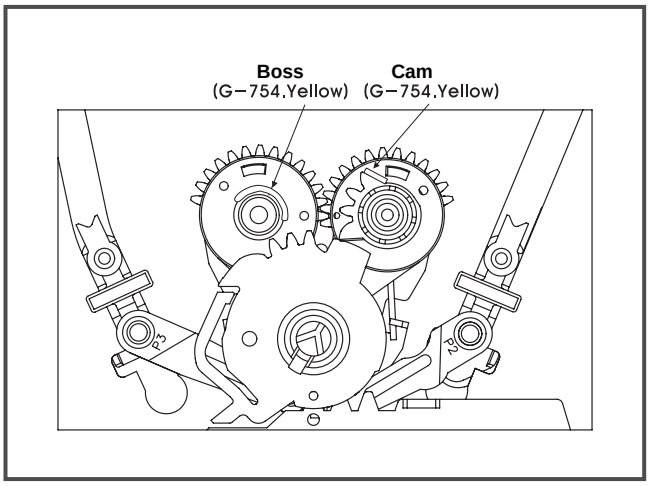


Plate Slider

Lever, F/R, Base, Tension

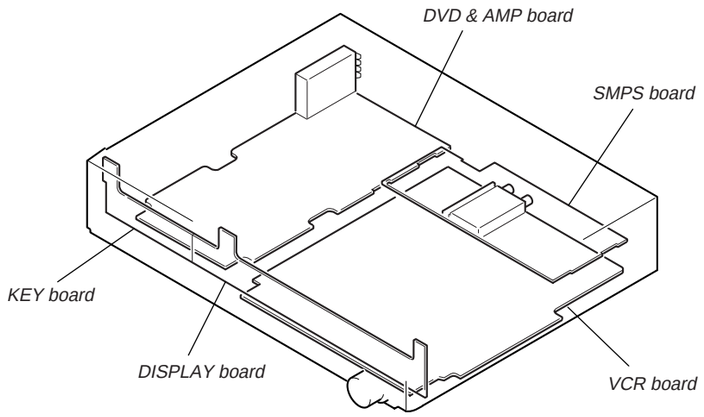


GEAR AY, P2 & P3



SECTION 5
DIAGRAMS

• Circuit Boards Location



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For schematic diagrams.
Note:
- All capacitors are in µF unless otherwise noted. (p: pF) 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

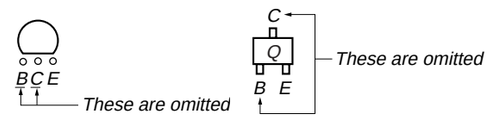
- ▬▬ : B+ Line.
- ▬ ▬ ▬ : B– Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages and waveforms are dc with respect to ground in service mode.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
  no mark : STOP
- Circled numbers refer to waveforms.
- Signal path.
  - : AUDIO
  - : CD
  - : DVD
  - : TUNER
  - : VIDEO
  - : Y
  - : CHROMA
  - : R, G, B

For printed wiring boards.
Note:
- ○——— : parts extracted from the component side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

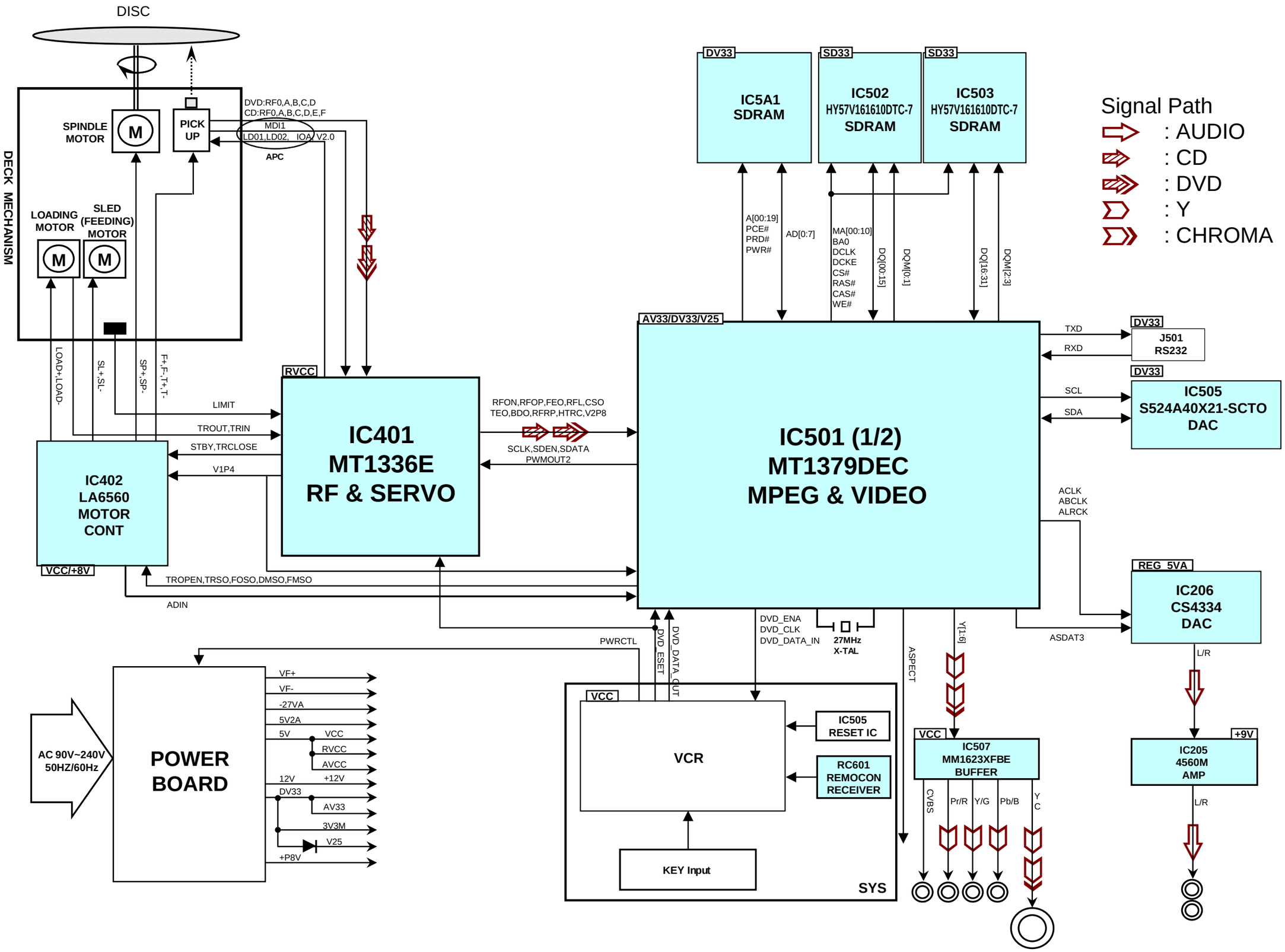
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

- Indication of transistor.

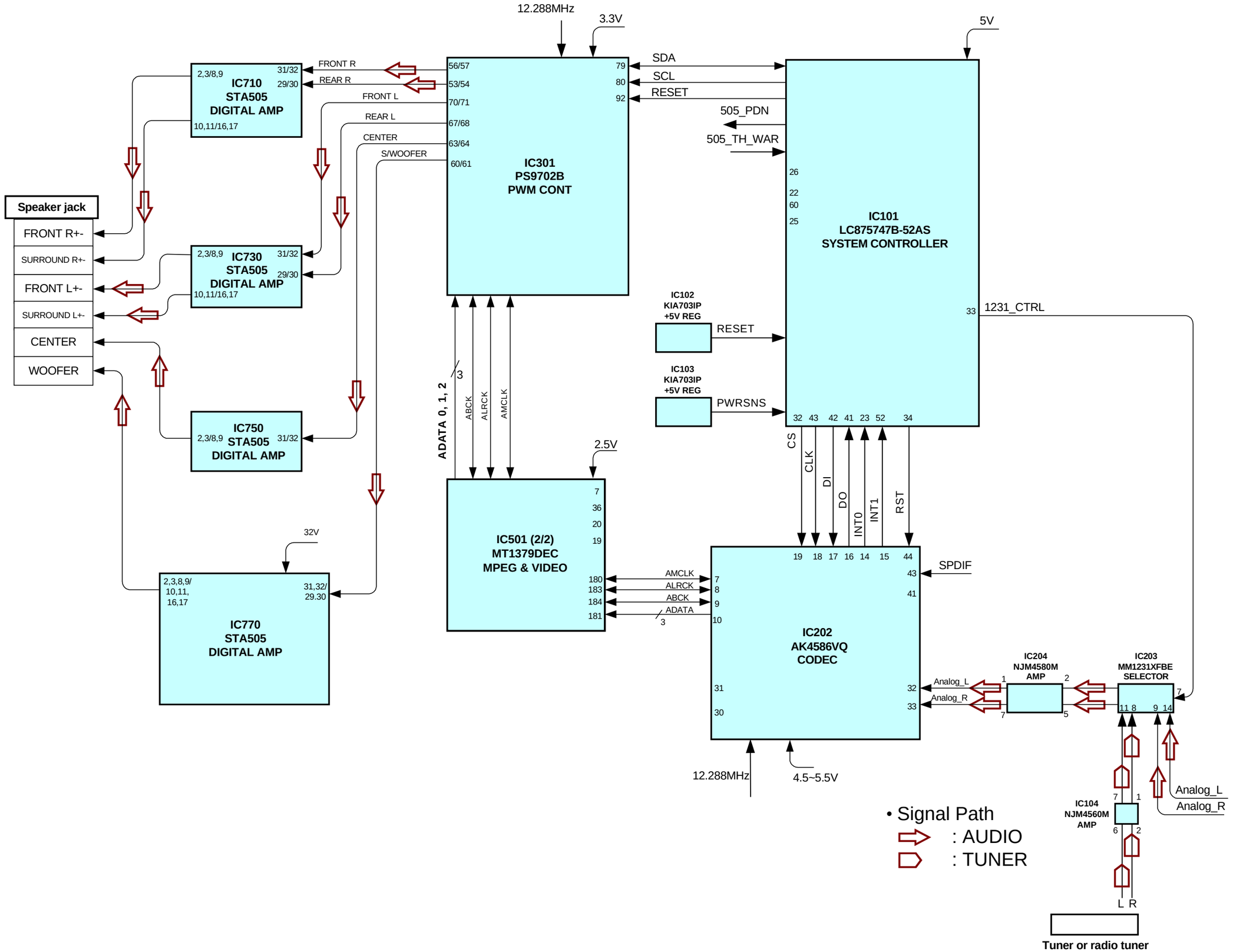


- Abbreviation
  AED : North European model
  RU : Russian model

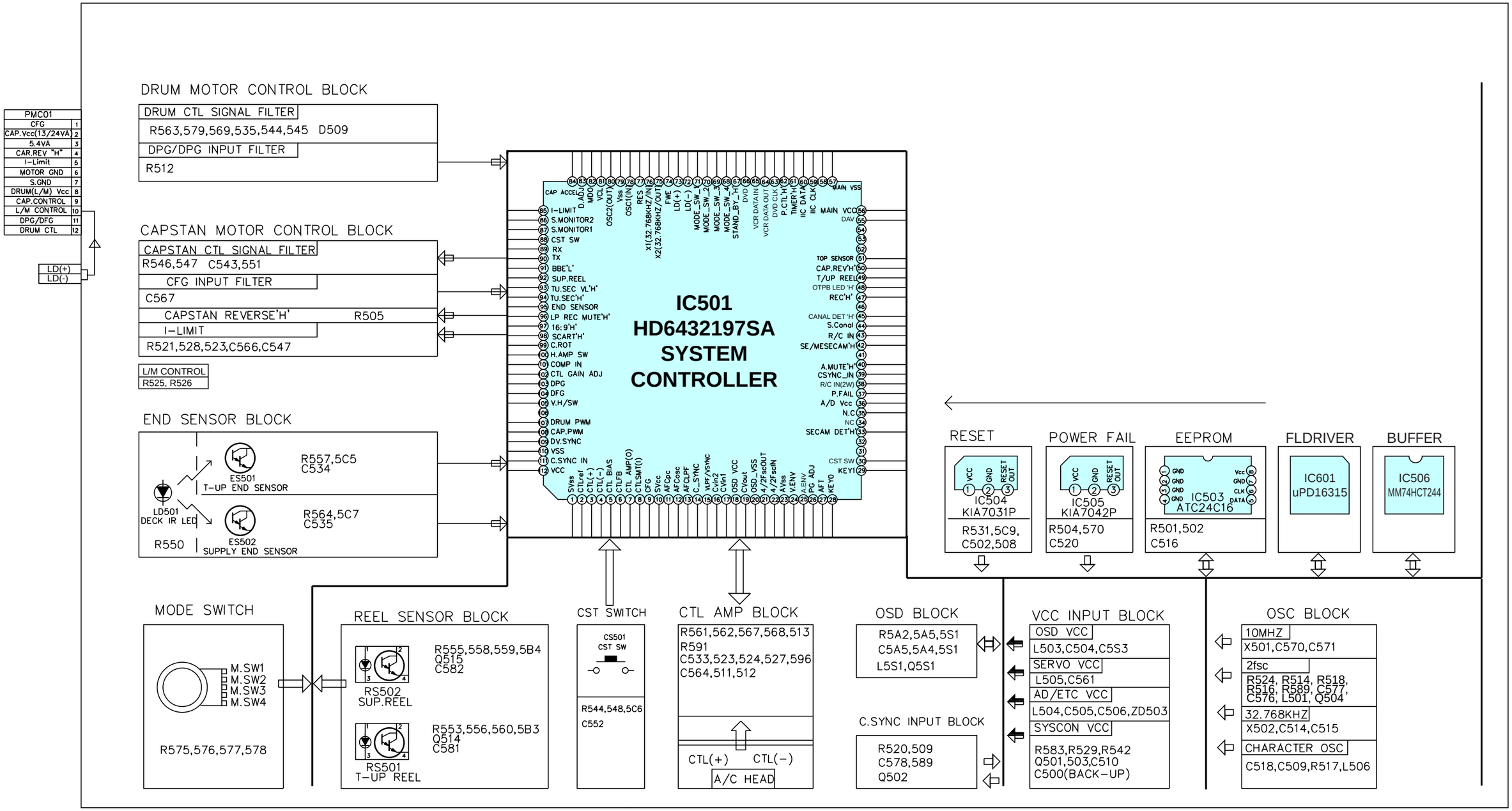
5-1. BLOCK DIAGRAM – DVD (OVERALL) SECTION –



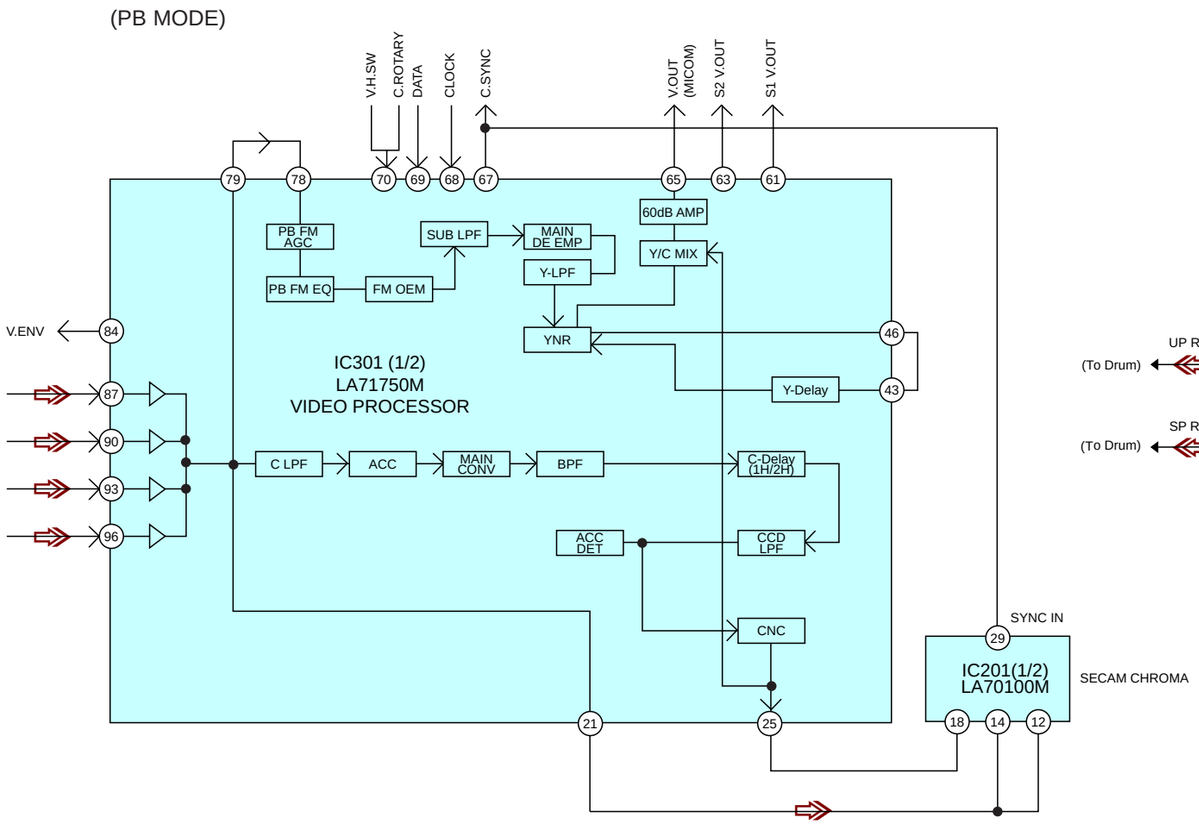
5-2. BLOCK DIAGRAM – DVD (AMP) SECTION –

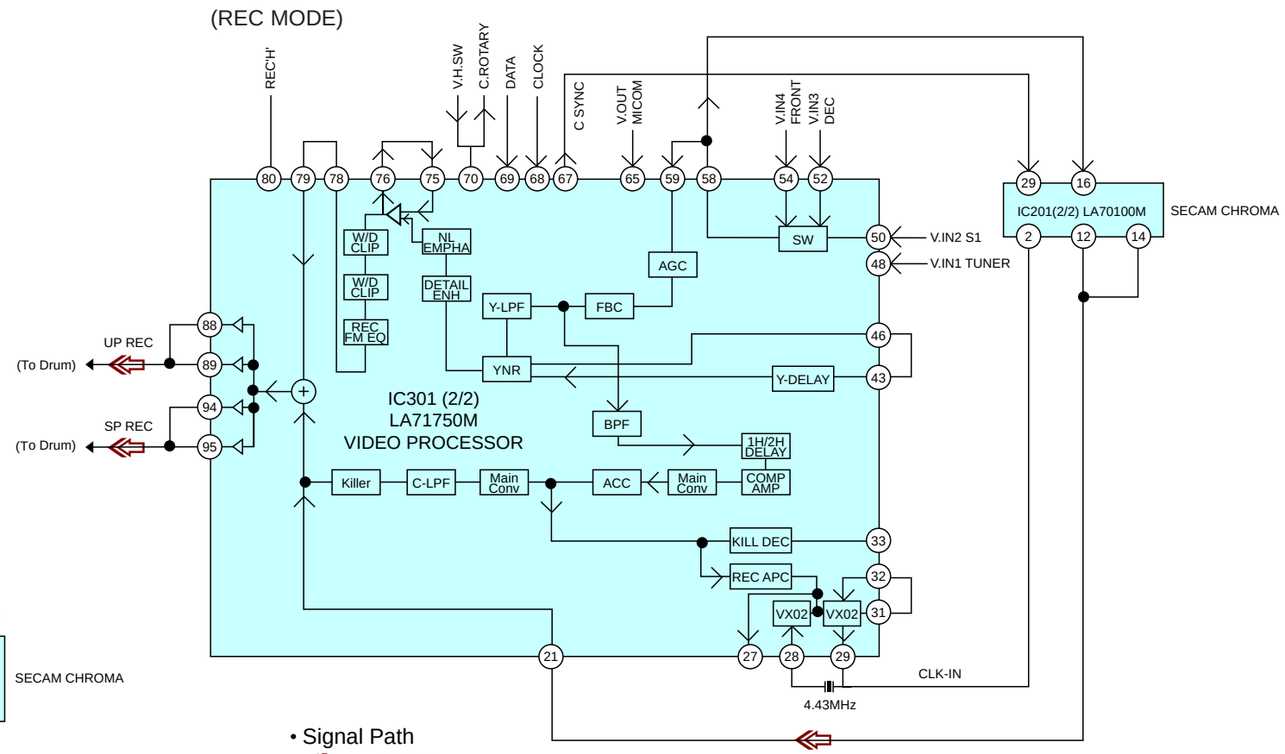


5-3. BLOCK DIAGRAM – VCR/PANEL SECTION –



5-4. BLOCK DIAGRAM – VCR (Y/C) SECTION –

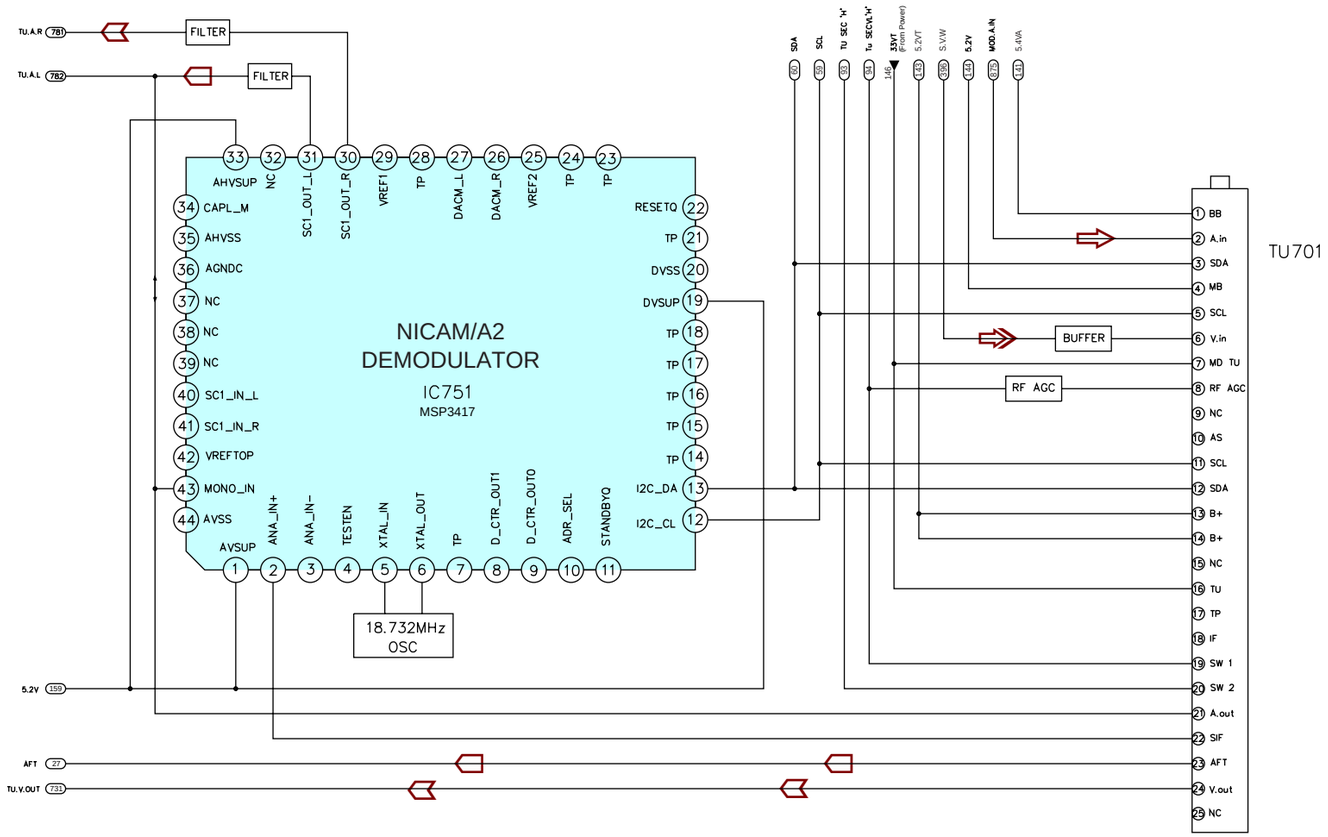




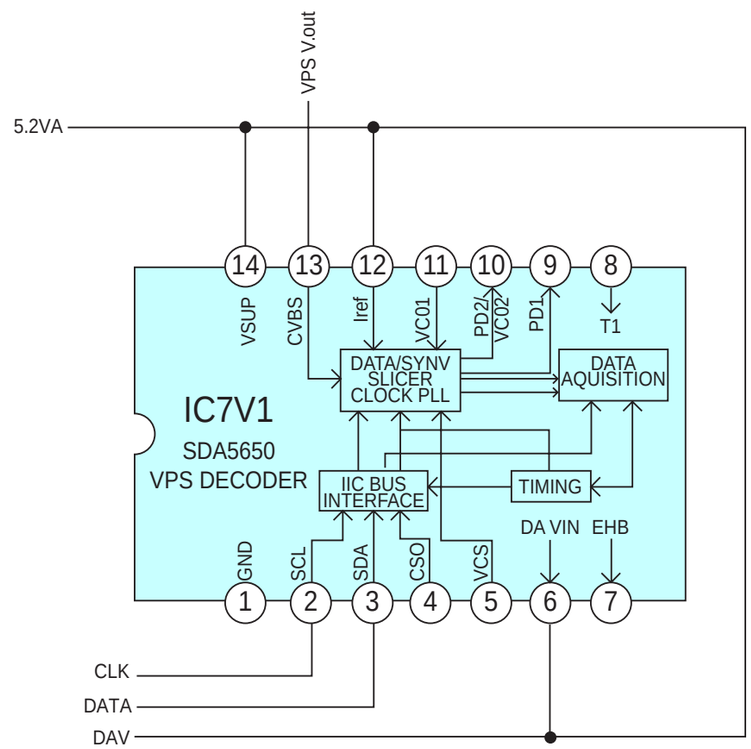
• Signal Path
: VIDEO

5-5. BLOCK DIAGRAM – VCR (TU-VPS) SECTION –

TUIF,NICAM&A2 BLOCK

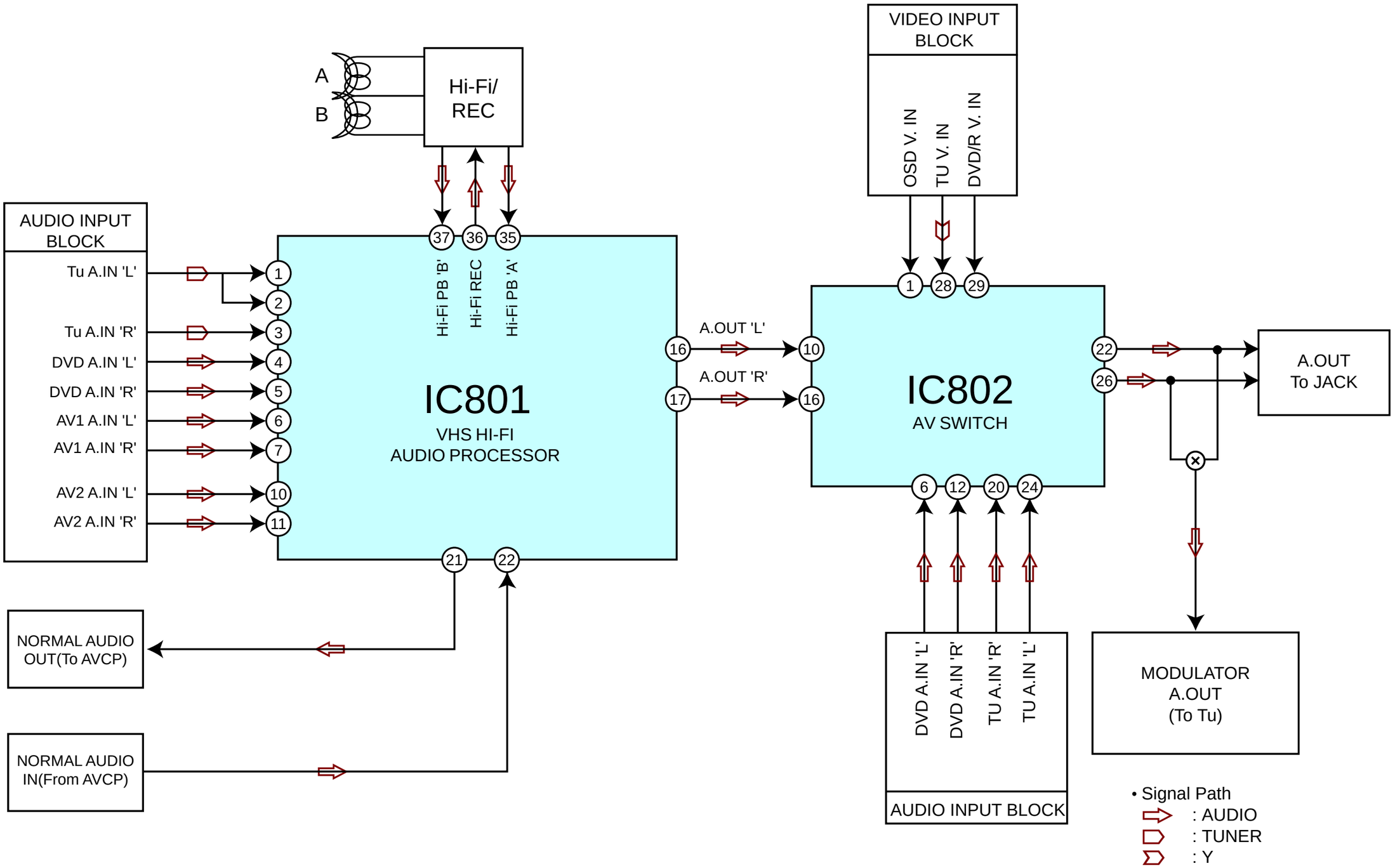


VPS BLOCK

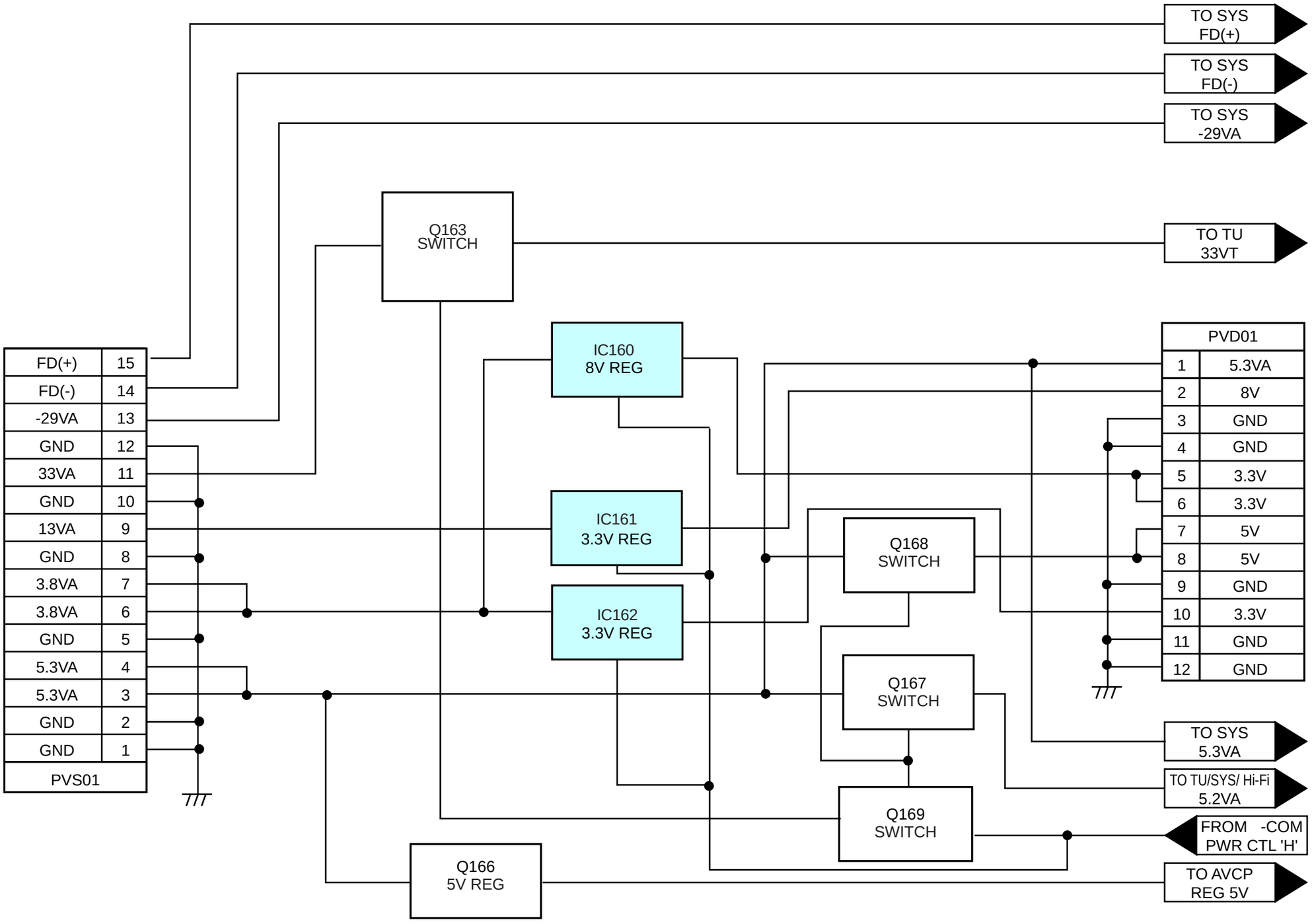


• Signal Path
- : TUNER
- : Y
- : AUDIO
- : VIDEO

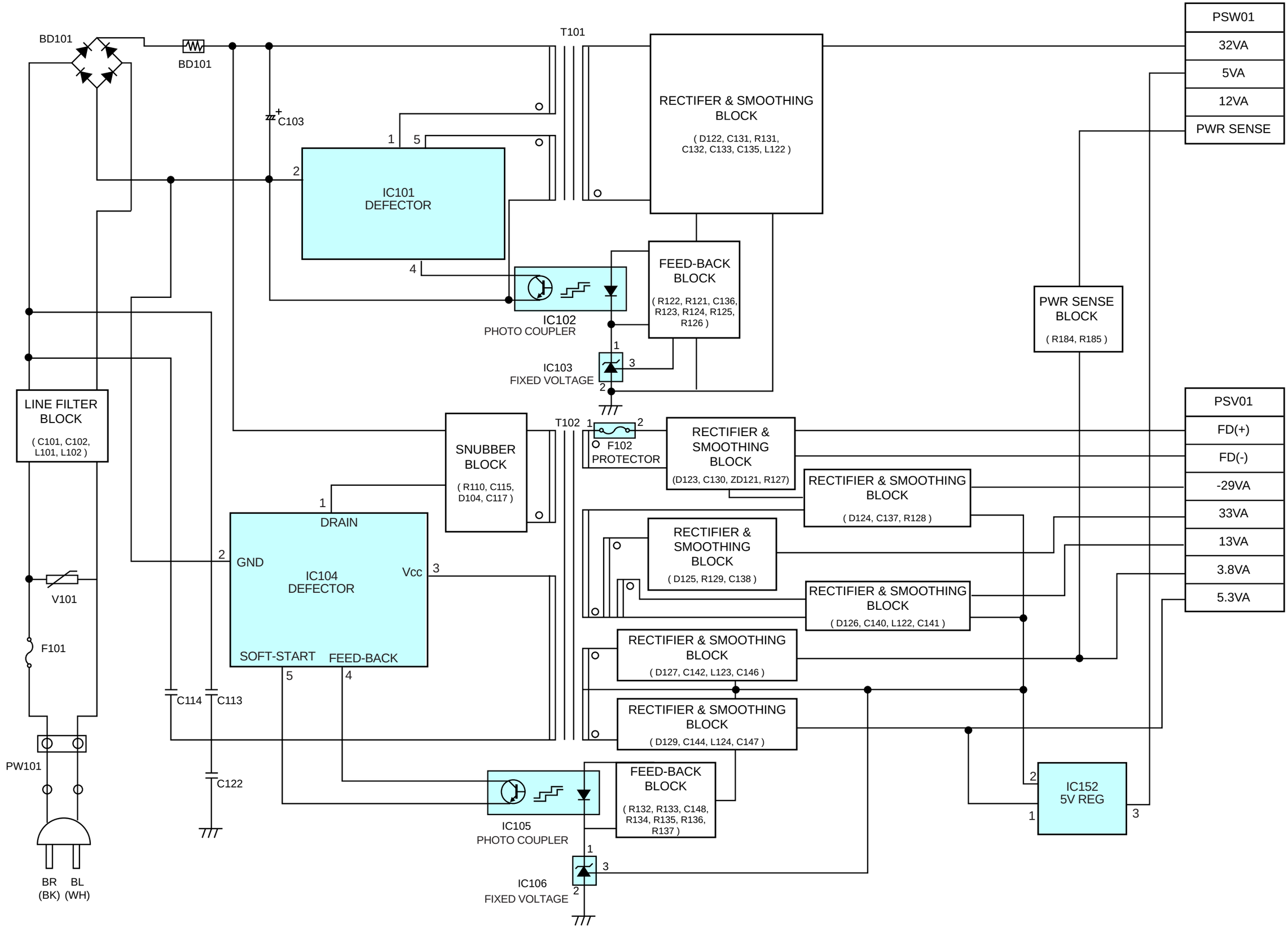
5-6. BLOCK DIAGRAM – VCR (HI-FI) SECTION –



5-7. BLOCK DIAGRAM – VCR POWER SECTION –



5-8. BLOCK DIAGRAM – POWER SECTION –

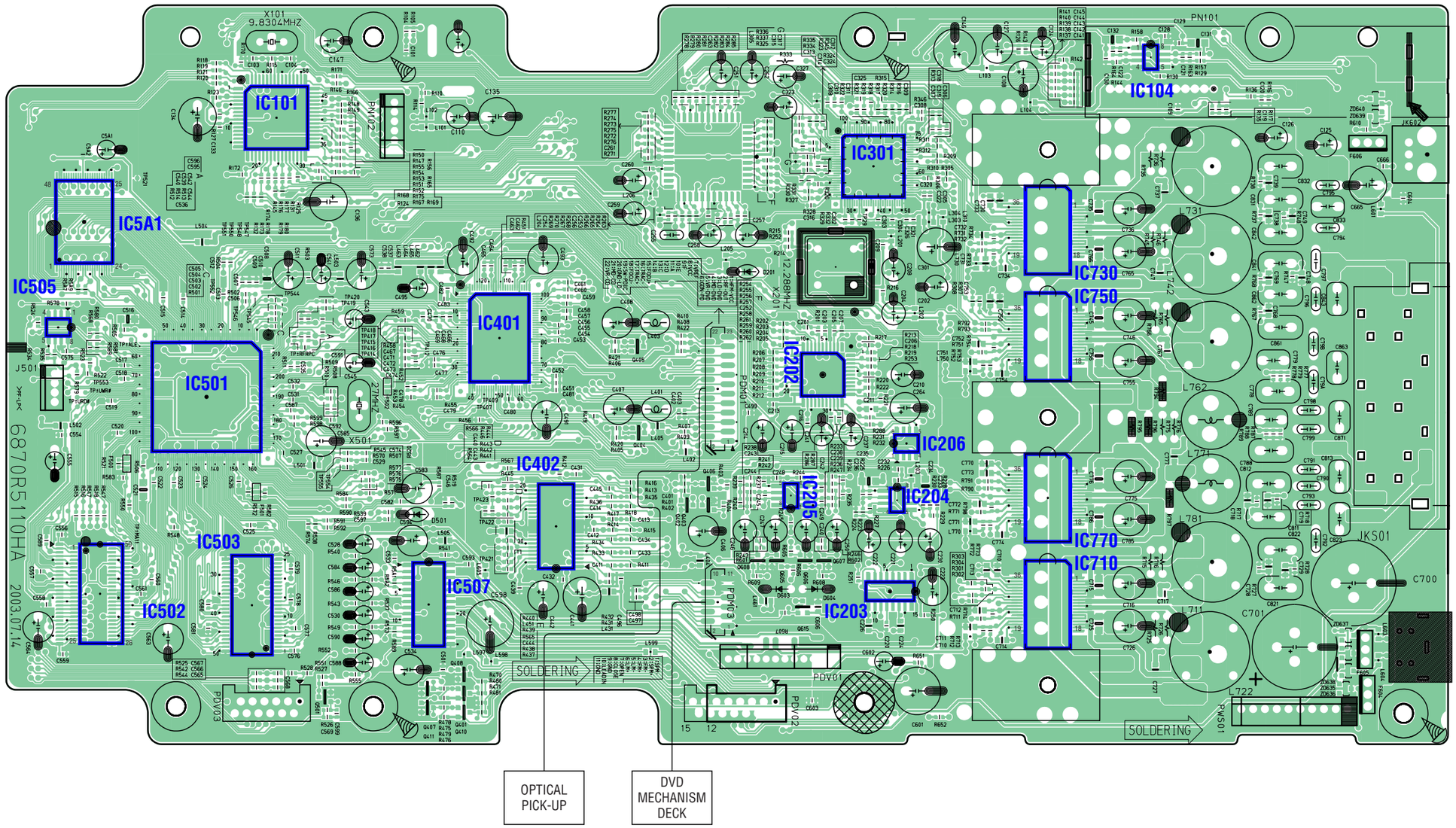


5-9. PRINTED WIRING BOARD – DVD & AMP SECTION (COMPONENT SIDE) –

• See page 51 for Circuit Boards Location.

	1	2	3	4	5	6	7
A							
B							
C							
D							

[DVD&AMP BOARD](COMPONENT SIDE)

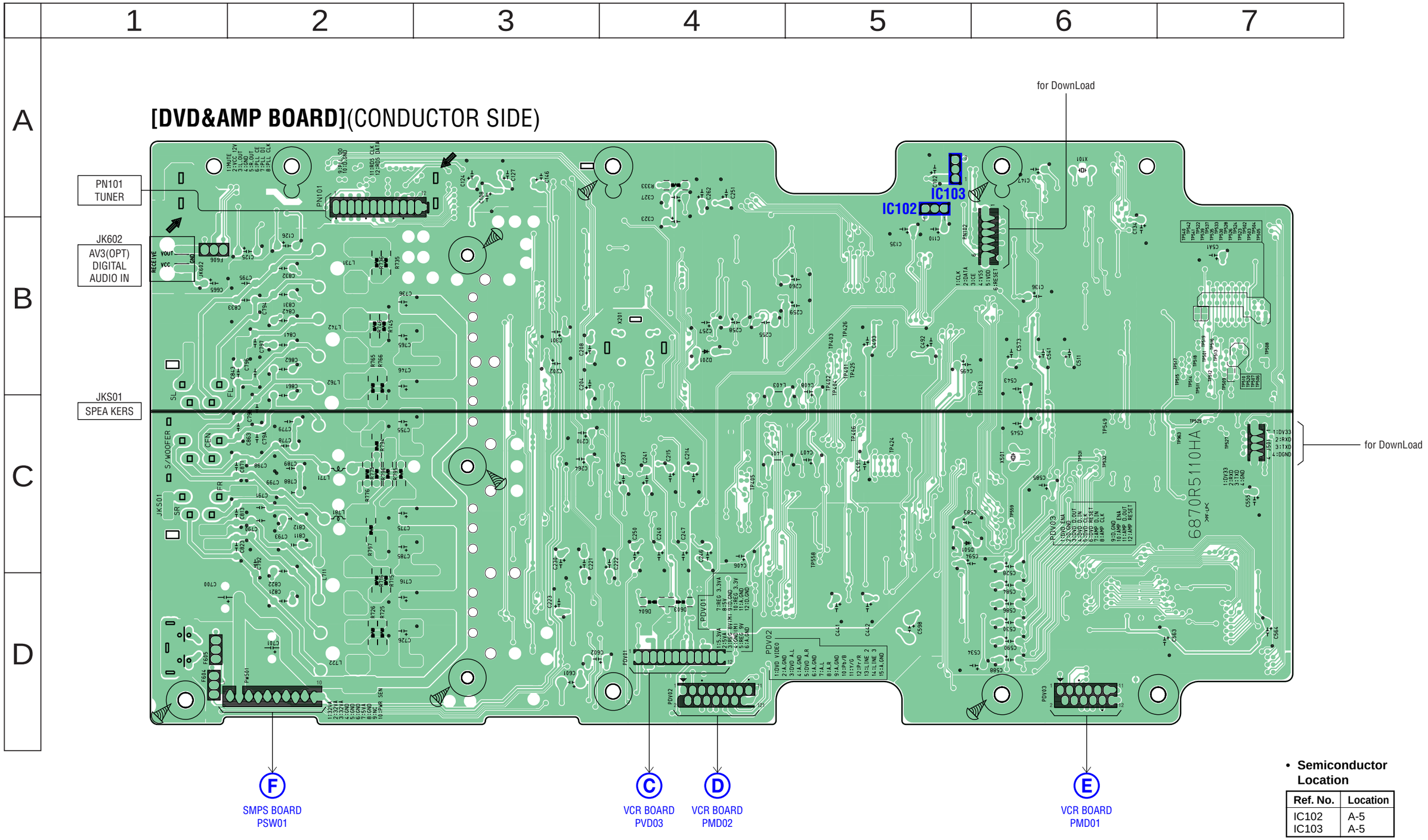


- **Semiconductor Location**

Ref. No.	Location
D501	C-3
D603	C-4
D604	C-4
IC101	A-2
IC104	A-6
IC202	C-4
IC203	D-4
IC204	C-5
IC205	C-4
IC206	C-5
IC301	B-4
IC401	B-3
IC402	C-3
IC501	C-2
IC502	C-1
IC503	C-2
IC505	B-1
IC507	C-3
IC5A1	B-1
IC710	C-5
IC730	B-5
IC750	B-5
IC770	C-5
Q401	D-3
Q402	C-4
Q403	C-4
Q404	C-3
Q405	C-3
Q406	C-4
Q407	D-2
Q408	D-3
Q410	D-3
Q411	D-2
Q501	D-2
Q605	C-4
Q606	C-4
Q607	C-4
Q608	C-4
Q615	D-4

5-10. PRINTED WIRING BOARD – DVD & AMP SECTION (CONDUCTOR SIDE) –

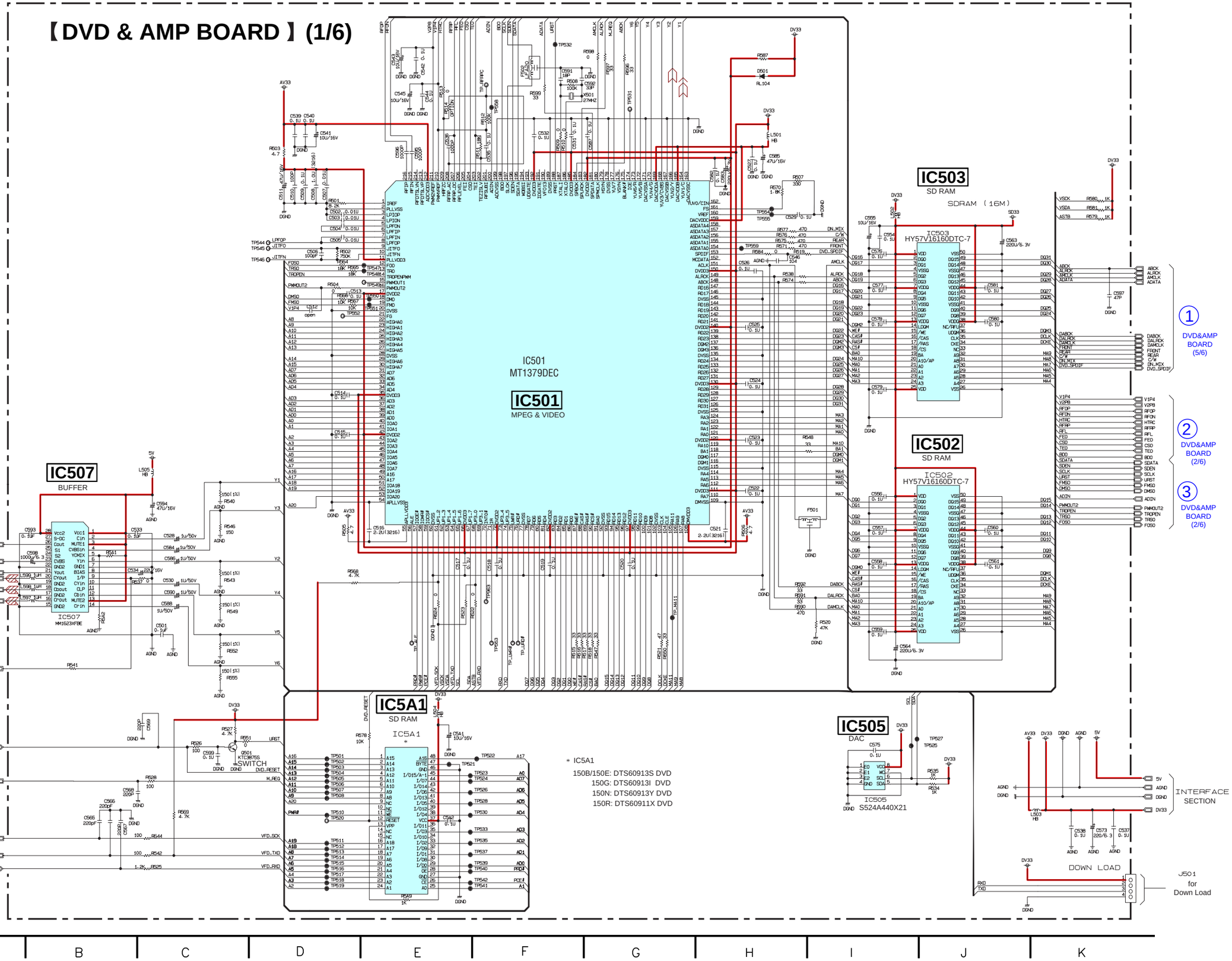
• See page 51 for Circuit Boards Location.



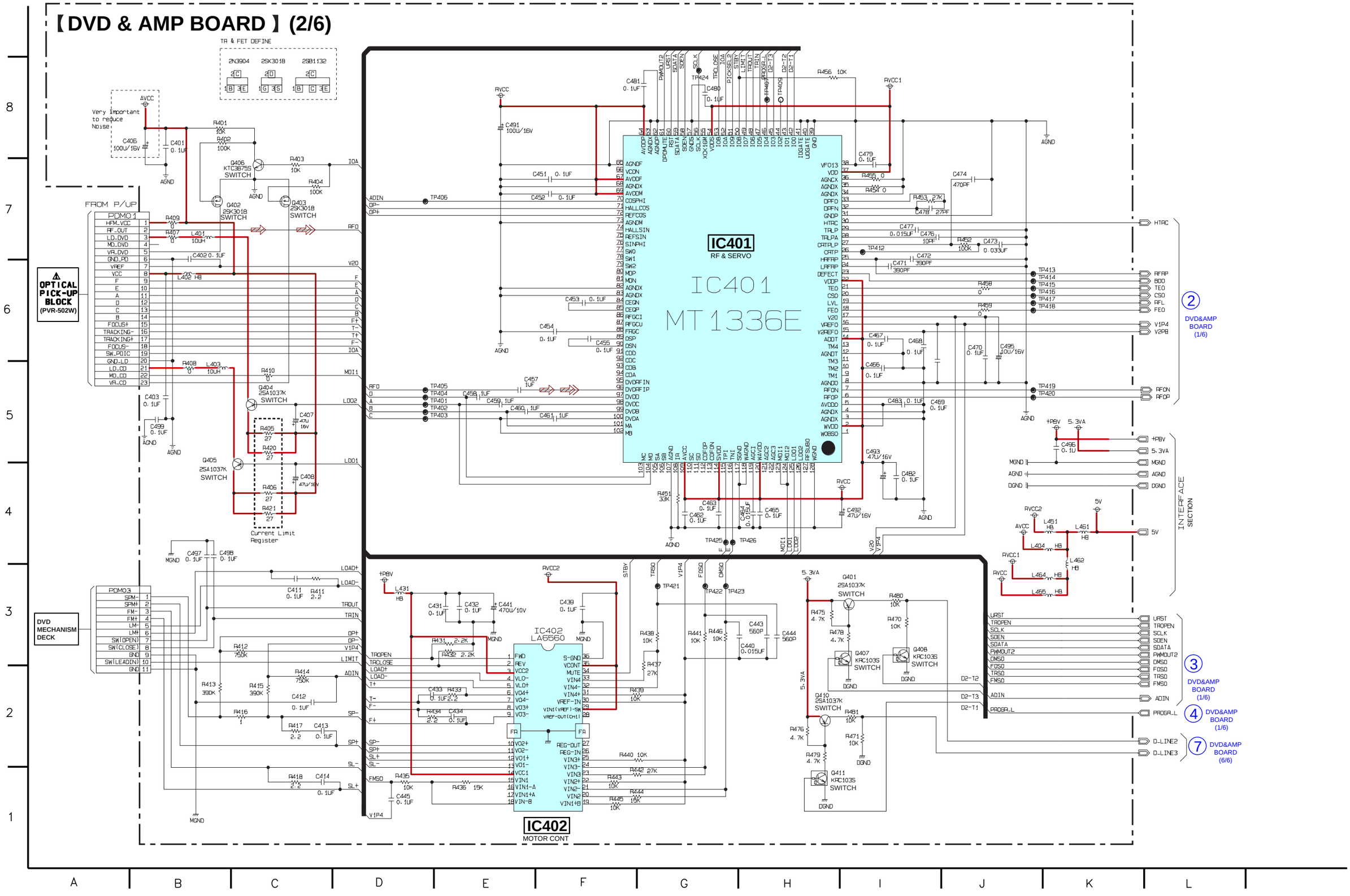
- **Semiconductor Location**

Ref. No.	Location
IC102	A-5
IC103	A-5

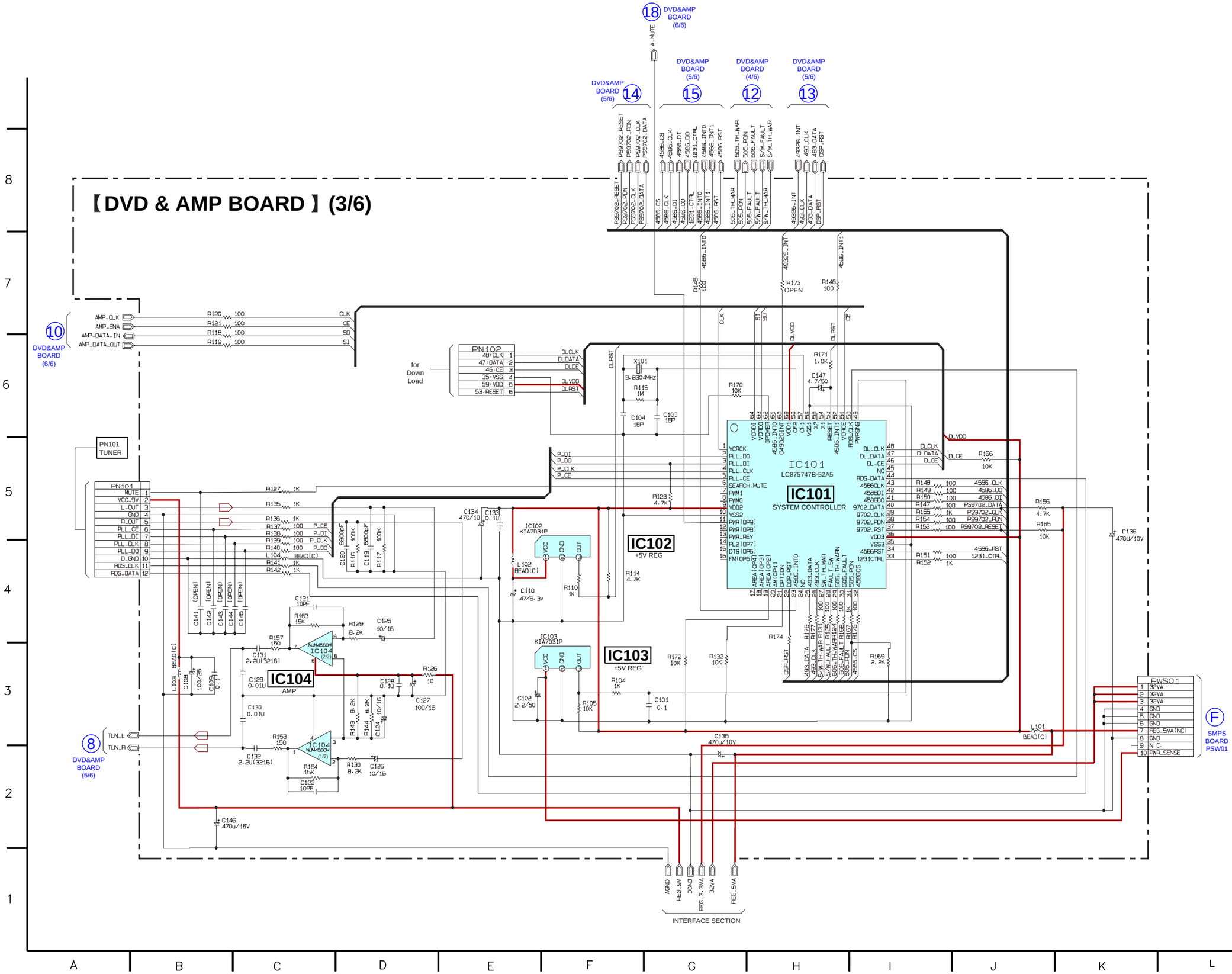
5-11. SCHEMATIC DIAGRAM – MPEG SECTION – [DVD & AMP BOARD] (1/6)



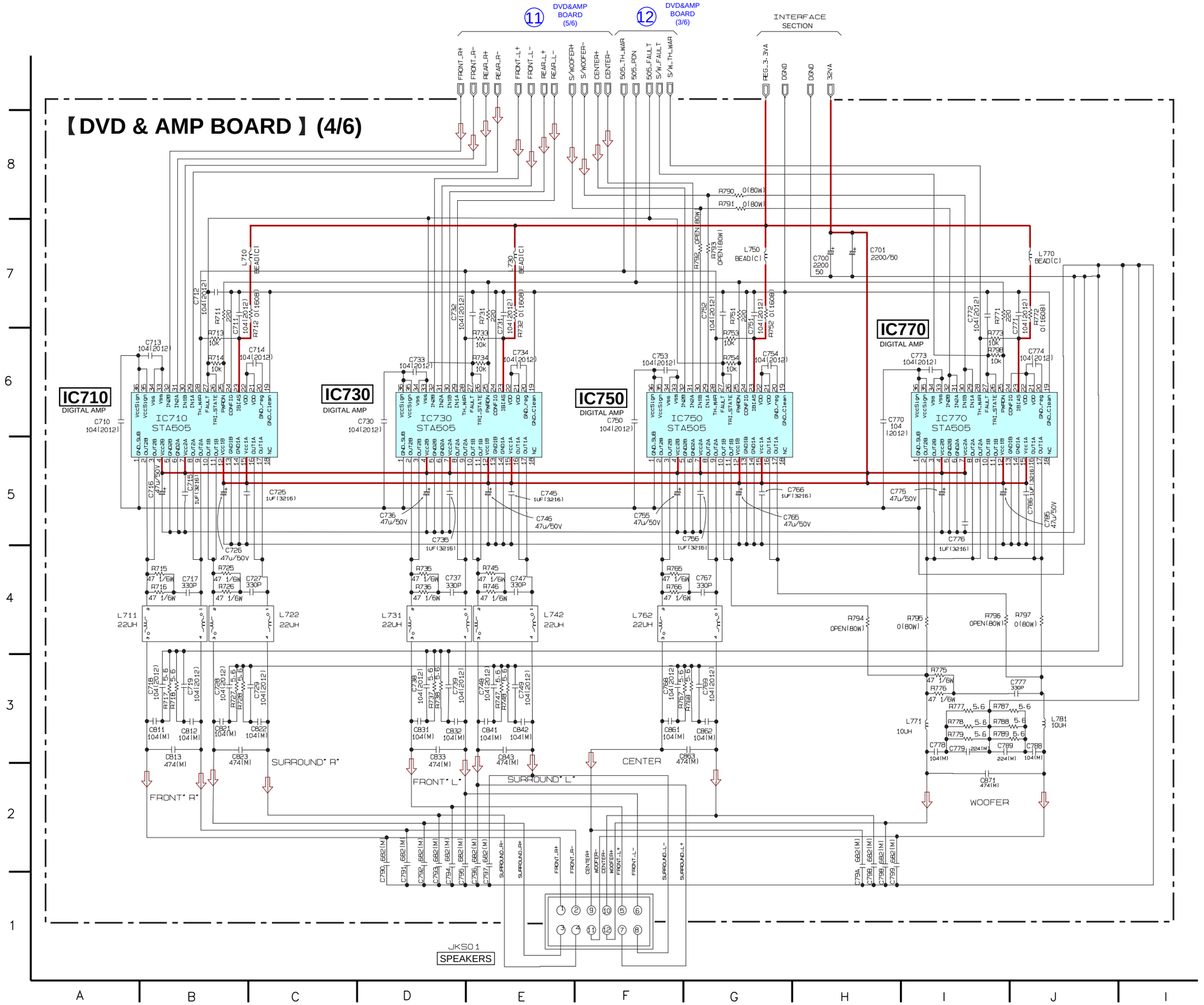
5-12. SCHEMATIC DIAGRAM – RF & SERVO SECTION – [DVD & AMP BOARD] (2/6)



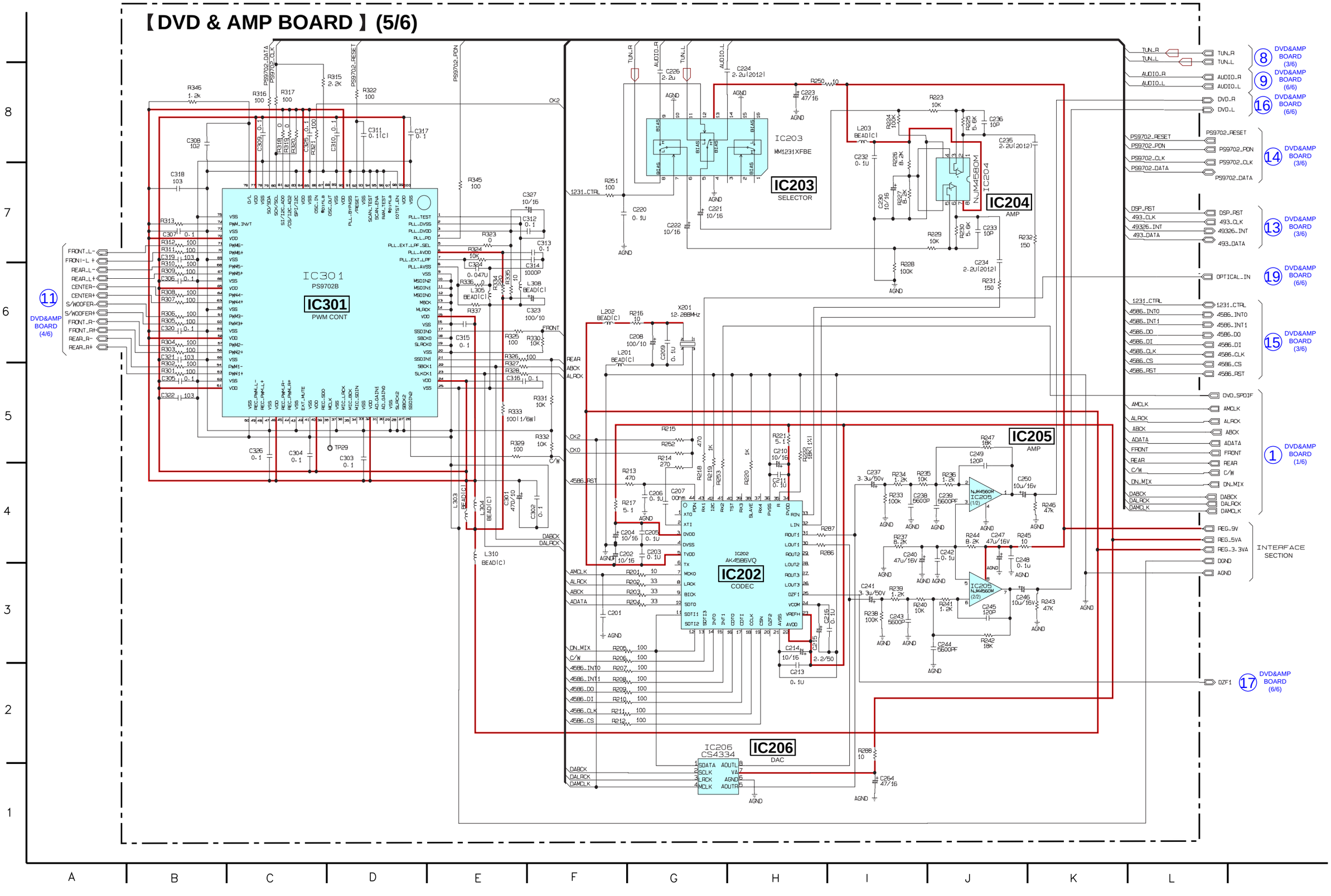
5-13. SCHEMATIC DIAGRAM – AUDIO, μ_COM SECTION – [DVD & AMP BOARD] (3/6)



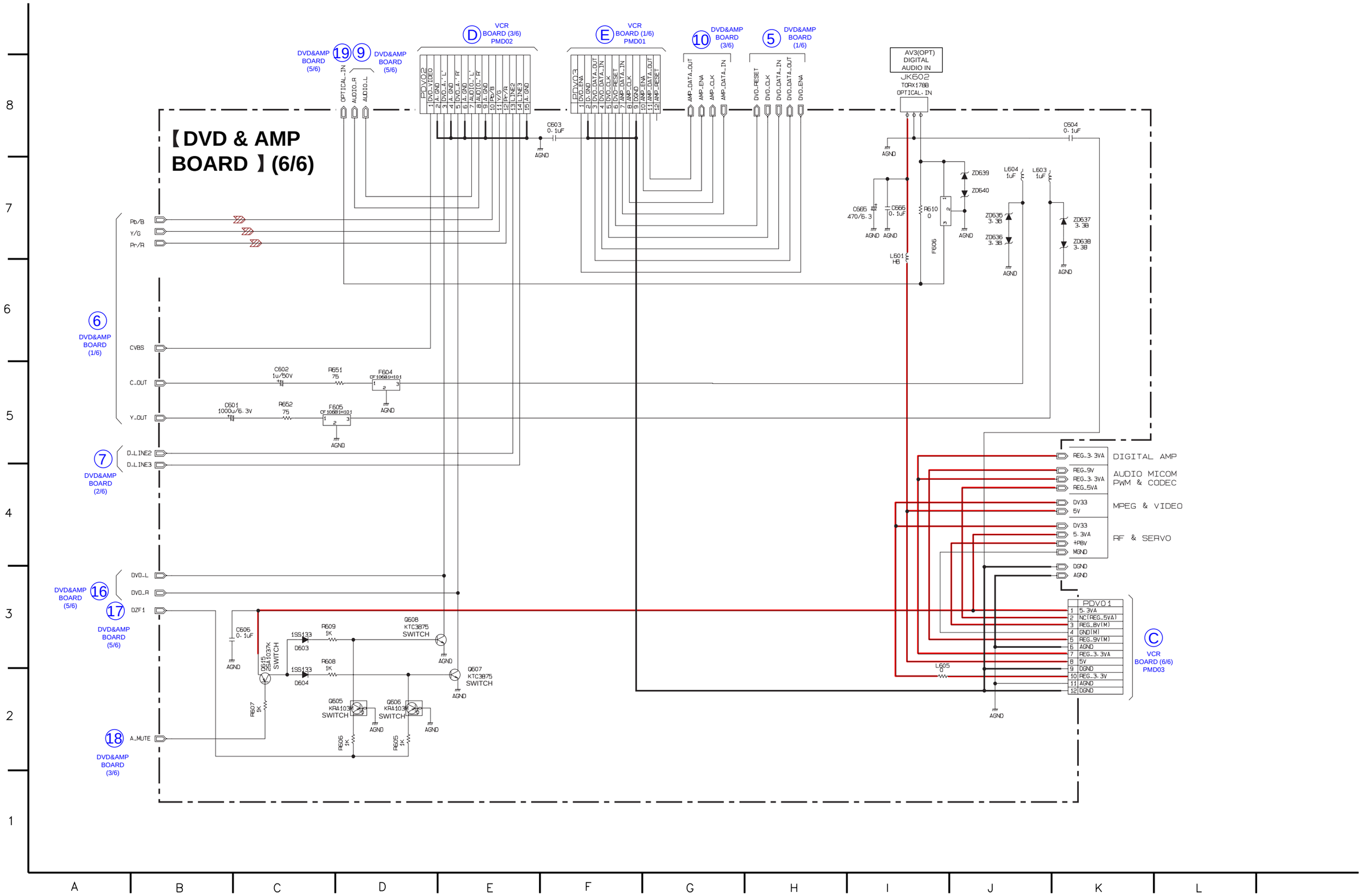
5-14. SCHEMATIC DIAGRAM – DIGITAL AMP SECTION – [DVD & AMP BOARD] (4/6)



5-15. SCHEMATIC DIAGRAM – PWM & CODEIC SECTION – [DVD & AMP BOARD] (5/6)



5-16. SCHEMATIC DIAGRAM – INTERFACE SECTION – [DVD & AMP BOARD] (6/6)



AVD-K150B/K150E/K150G/K150N/K150R

• VOLTAGE CHART (DVD & AMP BOARD) –1/2

MODE / PIN NO.	STOP	PLAY
IC101		
1	5.23	5.22
2	0	0
3	1.75	1.99
4	0	0
5	4.91	4.91
6	NC	NC
7	0.54	1.88
8	0.54	1.88
9	4.91	4.91
10	0	0
11	4.77	4.77
12	0.12	0.12
13	4.72	4.72
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	3.24	3.22
23	0.91	0.91
24	1.65	1.65
25	0	0
26	0	0
27	1.99	1.93
28	3.12	3.12
29	3.26	3.25
30	3.12	3.12
31	4.65	4.65
32	NC	NC
33	NC	NC
34	NC	NC
35	0	0
36	4.91	4.91
37	3.25	3.24
38	4.91	4.91
39	0	0
40	3.22	3.2
41	NC	NC
42	NC	NC
43	NC	NC
44	NC	NC
45	NC	NC
46	4.91	4.9
47	2.08	2.03
48	2.07	2.07
49	4.91	4.9
50	NC	NC
51	5.09	5.08
52	0	0
53	4.91	4.91
54	2.16	2.1

MODE / PIN NO.	STOP	PLAY
55	2.04	1.96
56	0	0
57	2.36	2.36
58	2.42	2.42
59	4.9	4.91
60	2.4	2.4
61	1.8	1.9
62	4.9	4.9
63	0	0
64	5.23	5.22
IC102		
1	4.93	4.93
2	0	0
3	4.93	4.93
IC103		
1	3.72	3.71
2	0	0
3	4.93	4.93
IC104		
1	6.04	6.04
2	6.04	6.04
3	6.04	6.04
4	0	0
5	6.04	6.04
6	6.04	6.04
7	6.04	6.04
8	12.09	12.08
IC202(AK4586)		
1	2.41	2.39
2	2.04	2.07
3	4.85	4.84
4	0	0.01
5	3.28	3.28
6	4.85	0.01
7	1.18	1.15
8	1.65	1.65
9	1.63	1.62
10	1.3	1.25
11	0	1.63
12	0	1.63
13	0	0.58
14	0	0.03
15	0	0.03
16	0.45	0.2
17	0	0.01
18	0	0.02
19	4.93	4.92
20	0	0.02
21	0	0.01
22	4.94	4.93
23	4.93	4.93
24	2.46	2.46
25	0	0.02
26	2.47	2.47
27	2.47	2.47

MODE / PIN NO.	STOP	PLAY
28	2.47	2.47
29	2.47	2.47
30	2.47	2.47
31	2.47	2.47
32	2.47	2.46
33	2.47	2.46
34	4.93	4.92
35	1.2	1.2
36	0	0.01
37	2.44	2.45
38	0	0.01
39	2.44	2.45
40	0	0.02
41	2.44	2.45
42	0	0.01
43	4.24	4.23
44	4.93	4.93
IC301		
1	0	0
2	0	0
3	3.21	3.18
4	4.91	4.91
5	3.21	3.18
6	2.95	2.92
7	1.72	1.7
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	3.21	3.18
16	0	0
17	0	0.9
18	0	0
19	0	0
20	0	0
21	0	0.9
22	1.59	1.6
23	1.63	1.62
24	3.22	3.18
25	0	0
26	0	0.9
27	0	0
28	0	0
29	0	0
30	NC	NC
31	NC	NC
32	3.21	3.18
33	0	0
34	NC	NC
35	NC	NC
36	NC	NC
37	0	0

MODE / PIN NO.	STOP	PLAY
38	1.6	1.59
39	NC	NC
40	3.21	3.18
41	0	0
42	NC	NC
43	0	0
44	NC	NC
45	NC	NC
46	3.21	3.18
47	0	0
48	NC	NC
49	NC	NC
50	0	0
51	3.21	318
52	0	0
53	1.59	1.58
54	1.59	1.58
55	0	0
56	1.59	1.58
57	1.59	1.58
58	3.21	3.18
59	0	0
60	1.59	1.58
61	1.59	1.58
62	0	0
63	1.59	1.58
64	1.59	1.59
65	3.21	3.18
66	0	0
67	1.59	1.58
68	1.59	1.58
69	0	0
70	1.59	1.58
71	1.59	1.58
72	3.21	3.18
73	0	0
74	0	0
75	0	0
76	3.1	3.09
77	3.21	3.18
78	0	0
79	3.22	3.2
80	0	0
81	3.21	3.18
82	3.21	3.18
83	0	0
84	3.21	3.18
85	0	0
86	1.67	1.67
87	NC	NC
88	NC	NC
89	0	0
90	3.21	3.18
91	0	0
92	3.25	3.24

MODE / PIN NO.	STOP	PLAY
93	0	0
94	0	0
95	0	0
96	0	0
97	NC	NC
98	0	0
99	3.21	3.18
100	0	0
IC401(MT1336E)		
1	1.03	2.99
2	5.11	5.08
3	0	0
4	0	0
5	5.11	5.07
6	0	1.95
7	0	0
8	0	0
9	5.11	0
10	5.11	5.08
11	5.11	5.08
12	0	0
13	5.11	0
14	5.11	5.08
15	2.84	2.81
16	1.45	1.43
17	2.08	2.07
18	1.37	1.42
19	0.69	2.3
20	2.4	0
21	2.35	0
22	5.11	5.08
23	0	0
24	2.59	3.2
25	0.19	1.88
26	1.58	0
27	2.56	3.13
28	2	2.01
29	2	2.06
30	2.96	1.52
31	0	0
32	0.06	2.07
33	0.07	2.07
34	0	0
35	0	0
36	0	0
37	5.13	0
38	0	0
39	0	0
40	0	0
41	0	0
42	5.12	5.09
43	5.12	5.09
44	5.12	5.09
45	5.12	5.09
46	5.12	5.09

MODE / PIN NO.	STOP	PLAY
47	0	0
48	5.12	5.09
49	5.12	0
50	5.08	5.06
51	5.09	5.07
52	5.1	0
53	0	0
54	5.13	0
56	1.61	0
57	0	0
58	0	0
59	0	0
60	0	0
61	3.28	0
62	0	0
63	0	0
64	0	0
65	0	0
66	0.026	0
67	5.12	5.08
68	0	0
69	5.12	0
70	3.21	2.03
71	3.46	2.2
72	2.81	0
73	0	0
74	0.21	0.09
75	0.22	0
76	0	0.1
77	0.21	0.09
78	0.23	0.09
79	0.21	0.08
80	0.23	0.08
81	0.22	0
82	0	0
83	0	0
84	0.07	0
85	0.07	2.27
86	1.97	0
87	1.96	1.9
88	1.54	1.71
89	0.19	2.22
90	0.21	0
91	0.22	0.06
92	0.22	0
93	0.23	0.06
94	0.23	0.06
95	2.28	0
96	2.28	2.25
97	2.27	1.23
98	2.27	2.23
99	2.27	2.23
100	2.16	2.23
101	2.08	2.17
102	2.07	2.17

MODE / PIN NO.	STOP	PLAY
103	2.07	2.18
104	2.08	0
105	0.13	0.15
106	0.14	0.16
107	0	0
108	1.28	1.28
109	5.18	5.05
110	0.14	0.16
111	0.15	0.15
112	0.13	0.16
113	0.14	0.15
114	5.1	5.05
115	2.07	2.06
116	2.06	2.09
117	0	0
118	0	0
119	0	0
120	5.1	5.05
121	0.13	0.15
122	0.14	0.15
123	0	0.18
124	0	0.18
125	5.08	5.03
126	5.08	3.16
127	0.06	2.08
128	0	0
IC402 (LA6560)		
1	0	0
2	0	0
3	8.04	8.01
4	0.12	0.06
5	0	0.06
6	3.64	3.69
7	3.62	3.61
8	3.64	3.53
9	3.6	3.76
10	3.62	2.43
11	3.63	4.85
12	3.62	3.72
13	3.64	3.57
14	8.04	8.01
15	1.45	1.48
16	0.27	1.39
17	0.29	1.32
18	1.45	1.43
19	1.45	1.43
20	1.45	0.82
21	1.45	1.43
22	1.45	1.43
23	1.47	1.37
24	1.45	1.43
25	1.45	1.43
26	0.95	0.9
27	0	0
28	1.45	1.43

MODE / PIN NO.	STOP	PLAY
29	5.15	5.11
30	1.45	1.43
31	1.45	1.43
32	1.45	1.43
33	1.46	1.45
34	5.08	5.06
35	5.15	5.11
36	0	0
IC501(MT1379)		
1	1.22	1.22
2	0	0
3	0.96	0.9
4	2	2.06
5	0	1.51
6	1.48	1.47
7	0	1.56
8	3.2	1.52
9	0.12	0.06
10	0.12	0.06
11	3.25	3.25
12	1.41	1.49
13	1.41	1.41
14	0	0
15	1.42	1.42
16	3.3	0
17	2.53	2.53
18	1.42	2.27
19	1.42	1.39
20	0	0
21	2.61	2.58
22	0.75	1.46
23	2.83	1
24	1.9	0.89
25	1.72	0.39
26	0.68	0.31
27	2.84	3.16
28	0	0
29	2.85	0.66
30	1.83	0.49
31	0.91	1.39
32	1.43	1.2
33	1.51	1.57
34	1.51	1.43
35	3.3	3.29
36	0.81	1.26
37	1.45	1.02
38	1.82	1.6
39	1.2	1.5
40	2	2.06
41	2.17	1.95
42	2.53	2.52
43	1.96	1.9
44	1.79	1.9
45	0.8	1.72
46	0.8	1.96

MODE / PIN NO.	STOP	PLAY
47	0.8	1.84
48	3.3	2.63
49	0	0.13
50	0	0.07
51	0	0
52	0	0
53	0	0
54	0	0
55	3.25	3.27
56	1.2	1.18
57	0	0
58	3.29	3.29
59	0	0
60	0	0
61	2.59	2.57
62	2.58	2.58
63	0	0
64	2.59	2.56
65	3.29	3.29
66	3.3	3.29
67	3.29	3.29
68	2.57	2.56
69	5.19	5.18
70	2.59	2.57
71	0.12	0.08
72	2.53	2.52
73	2.59	2.57
74	3.29	3.29
75	2.61	2.61
76	3.27	3.24
77	0	0
78	0.94	1.04
79	0.78	1.06
80	0.89	1.15
81	0.99	1.34
82	2.52	2.52
83	3.09	1.33
84	0.37	1.16
85	3.08	1.1
86	3.07	1.08
87	0.59	1.04
88	1.57	2.53
89	3.2	3.13
90	2.77	2.53
91	0.22	1.68
92	0	0
93	3.32	1
94	0.16	1.58
95	3.31	1.62
96	3.3	1.08
97	3.3	3.29
98	3.32	1.62
99	0.16	1.09
100	3.32	1.27
101	3.3	1.32

MODE / PIN NO.	STOP	PLAY
102	0	0
103	1.56	1.55
104	0.94	1.25
105	0.41	0
106	0.05	0.06
107	0	0.06
108	3.27	3.26
109	0	0
110	0.19	1.74
111	3.3	3.29
112	0.18	1.62
113	2.98	2.38
114	3.02	1.48
115	0	0
116	2.86	3.01
117	2.86	2.54
118	0	0
119	0	2.5
120	2.55	2.51
121	3.03	1.4
122	3.03	1.4
123	0.22	1.39
124	0.22	0.34
125	0	0
126	3.31	0.98
127	0.26	1.64
128	3.31	1.53
129	3.3	1.15
130	3.3	3.29
131	3.31	1.49
132	0.16	0.89
133	3.3	0
134	3.3	1.07
135	0	0
136	2.86	2.53
137	2.86	2.53
138	0.07	0.86
139	0.09	0.99
140	0.07	2.51
141	0.07	0.94
142	0.09	1.13
143	0.07	1.19
144	0.09	1.07
145	0.09	0
146	0	1.51
147	0.09	1.25
148	0.07	1.64
149	0.06	0
150	0	1.65
151	0.07	3.29
152	0	1.6
153	0	1.64
154	0	1.44
155	0	0
156	0	0

• **VOLTAGE CHART (DVD & AMP BOARD) –2/2**

MODE / PIN NO.	STOP	PLAY
157	0	1.63
158	0	3.29
159	0	3.27
160	0	1.27
161	0	1.27
162	0	2.35
163	0	0
164	0	0.73
165	0	3.27
166	0	0.5
167	0	0
168	0	0.53
169	0	3.27
170	0	0.59
171	0	0
172	3.01	0.72
173	0	0.72
174	0	0
175	0	2.73
176	0	3.13
177	0	3.13
178	0	3.25
179	0	0
180	0	0
181	2.04	2.64
182	0	2.52
183	0	0
184	0	0.09
185	0	3.26
186	_	_
187	0	0.08
188	0	0
189	0	0
190	0	0
191	0.23	0
192	0	3.29
193	0	0
194	0	0
195	0	0
196	0	0
197	0	1.63
198	0	0
199	0	0
200	0	2.15
201	0	1.44
202	0	1.44
203	0	1.43
204	0	1.43
205	0	1.42
206	0	2.1
207	0	2.07
208	0	1.41
209	0	1.52
210	0	1.43
211	0	2.81

MODE / PIN NO.	STOP	PLAY
212	0	3.28
213	0	0.12
214	0	0.12
215	1.02	1.43
216	0	1.43
IC502(SDRAM)		
1	3.27	3.28
2	1.18	1.26
3	1.1	1.52
4	0	0
5	0.66	1.07
6	0.85	1.12
7	3.27	3.28
8	0.51	0.97
9	3.06	0
10	0	0
11	0.06	0.98
12	3.18	0.87
13	3.27	3.28
14	2.94	2.56
15	0.47	0.42
16	2.93	3.01
17	3.21	3.22
18	2.87	2.95
19	0.15	1.32
20	0	0.05
21	3.09	1.32
22	3.09	1.32
23	3.09	1.32
24	3.09	1.33
25	3.27	3.29
26	0	0
27	0.15	1.36
28	1.84	2.36
29	1	2.32
30	0.54	1.75
31	0.06	0.06
32	0.05	0.06
33	0	0
34	0.73	1.26
35	1.48	1.55
36	2.91	2.53
37	0.07	0
38	3.27	3.28
39	1.06	1.05
40	0.47	0.98
41	0	0
42	0	0.6
43	1.12	1.24
44	3.27	3.28
45	1.21	0.99
46	1.31	1.34
47	0	0
48	1.43	1.44
49	0.88	1.01

MODE / PIN NO.	STOP	PLAY
50	0	0
IC505(EEPROM)		
1	0	0
2	0	0
3	0	0
4	0	0
5	3.28	3.29
6	3.28	3.29
7	0	0
8	3.28	3.29
IC507(MM1623)		
1	5.09	5.08
2	2.43	2.42
3	5.09	5.08
4	1.45	0
5	0	0
6	1.45	1.69
7	0	0
8	2.47	2.46
9	0	0
10	1.14	1.76
11	0	0
12	2.42	2.42
13	5.09	5.08
14	2.43	2.42
15	0	0
16	2.49	2.47
17	0	0
18	2.48	2.47
19	0	0
20	1.18	2.3
21	1.76	2.17
22	0	0
23	1.76	2.24
24	0	0
25	0	0
26	0	0
27	0.06	0.05
28	5.09	0
IC5A1(FLASH)		
1	0.08	0.16
2	1.82	0.45
3	2.84	0
4	2.83	3.12
5	0.69	0.26
6	1.72	0.25
7	1.92	0.9
8	1.7	1.45
9	0	0
10	0	0
11	3.27	3.29
12	3.56	3.55
13	3.29	3.29
14	0	0
15	0.23	0.06

MODE / PIN NO.	STOP	PLAY
16	0	0
17	0	0
18	0	0.87
19	1.98	2.64
20	2.28	2.18
21	2.13	1.96
22	1.67	2.01
23	1.99	1.72
24	1.93	2.19
25	2.05	1.94
26	0	0
27	0	0
28	0	0
29	1.49	2.03
30	0.16	1.07
31	1.96	1.25
32	0.16	1.1
33	0.99	2.2
34	1.17	1.07
35	0.79	1.82
36	0.15	1.07
37	3.29	3.3
38	1.93	3.09
39	0.16	1.07
40	1.5	2.2
41	0.16	1.07
42	1.21	2.64
43	0.16	1.08
44	1.64	1.48
45	2.05	2.06
46	0	0
47	0	0
48	0.07	0.13
IC710		
1	0	0
2	15.6	15.6
3	15.6	15.6
4	3.59	31.58
5	0	0
6	0	0
7	31.59	31.58
8	15.62	15.62
9	15.62	15.62
10	15.61	15.61
11	15.61	15.61
12	31.59	31.59
13	0	0
14	0	0
15	31.59	31.59
16	15.61	15.61
17	15.61	15.61
18	NC	NC
19	0	0
20	0.02	0.02
21	5.02	5.02

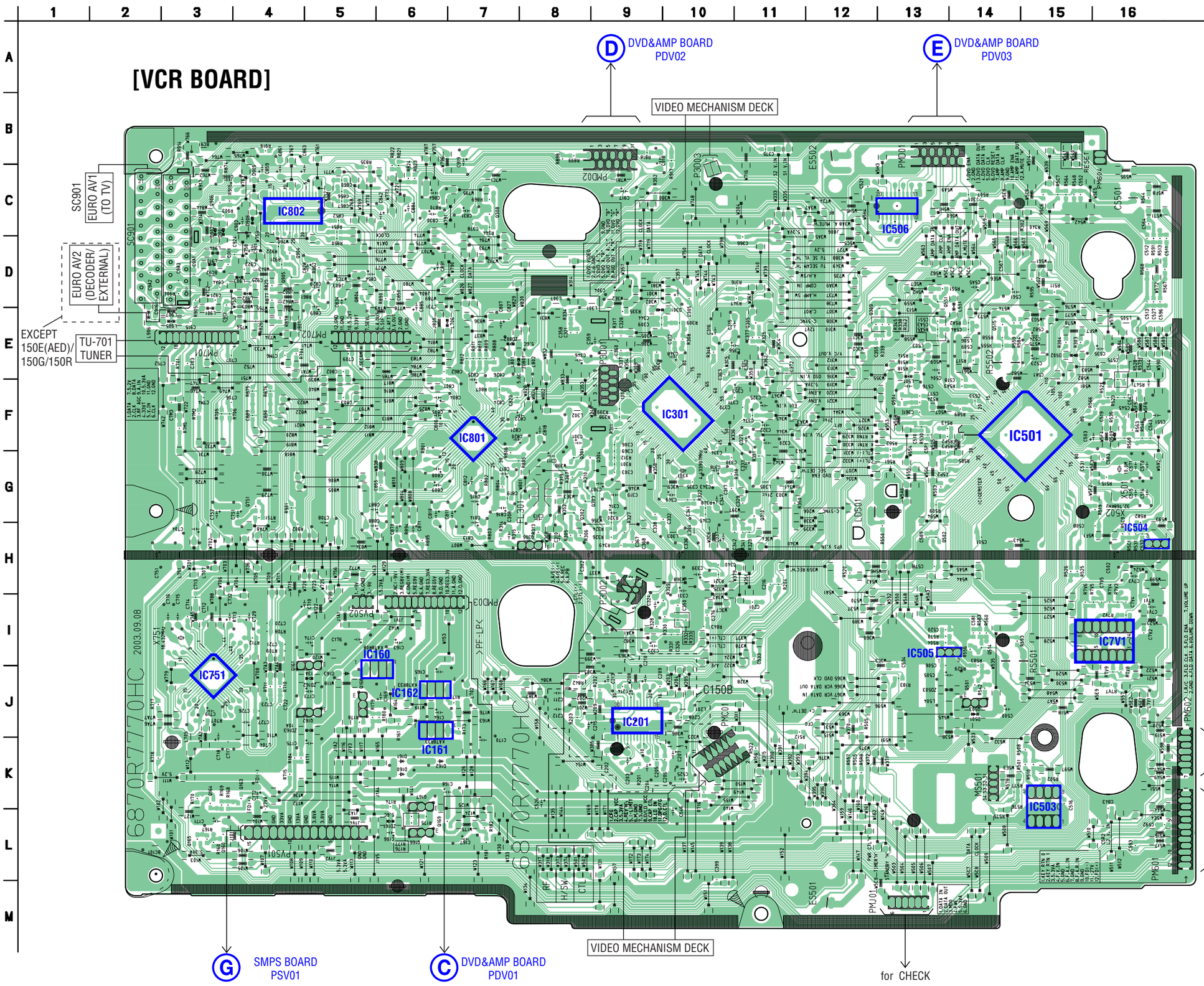
MODE / PIN NO.	STOP	PLAY
22	5.02	5.02
23	3.25	3.24
24	0	0
25	3.15	3.15
26	3.15	3.15
27	3.15	3.15
28	3.24	3.23
29	1.58	1.57
30	1.58	1.57
31	1.58	1.57
32	1.58	1.57
33	26.32	26.31
34	26.32	26.31
35	31.58	31.57
36	31.58	31.57
IC730		
1	0	0
2	15.6	15.6
3	15.6	15.6
4	31.59	31.58
5	0	0
6	0	0
7	31.59	31.58
8	15.62	15.62
9	15.62	15.62
10	15.61	15.61
11	15.61	15.61
12	31.59	31.59
13	0	0
14	0	0
15	31.59	31.59
16	15.61	15.61
17	15.61	15.61
18	NC	NC
19	0	0
20	0.02	0.02
21	5.02	5.02
22	5.02	5.02
23	3.24	3.23
24	0	0
25	3.15	3.15
26	3.15	3.15
27	3.15	3.15
28	3.24	3.23
29	1.58	1.57
30	1.58	1.57
31	1.58	1.57
32	1.58	1.57
33	26.3	26.3
34	26.3	26.3
35	31.58	31.57
36	31.58	31.57
IC750		
1	0	0
2	15.6	15.6

MODE / PIN NO.	STOP	PLAY
3	15.6	15.6
4	31.59	31.58
5	0	0
6	0	0
7	31.59	31.58
8	15.62	15.62
9	15.62	15.62
10	15.61	15.61
11	15.61	15.61
12	31.59	31.59
13	0	0
14	0	0
15	31.59	31.59
16	15.61	15.61
17	15.61	15.61
18	NC	NC
19	0	0
20	0.03	0.03
21	5.06	5.06
22	5.06	5.06
23	3.24	3.23
24	0	0
25	3.15	3.15
26	3.15	3.15
27	3.15	3.15
28	3.24	3.23
29	1.58	1.57
30	1.58	1.57
31	1.58	1.57
32	1.58	1.57
33	26.3	26.3
34	26.3	26.3
35	31.58	31.57
36	31.58	31.57

SECTION	NO	STOP			PLAY		
		B	E	C	B	E	C
DVD&AMP	Q401	5.2	5.19	0	5.2	5.19	0
	Q402	0	0	0	0	0	0.22
	Q403	5.08	0	0	4.93	0	0
	Q404	5.01	5.08	0	4.96	5.02	0
	Q405	5.01	5.08	0.44	3.32	4.01	1.9
	Q407	0	0	5.2	0	0	0
	Q408	2.85	0	0	2.83	0	0
	Q410	5.2	5.2	0	0	5.2	0
	Q411	0	0	5.2	0	0	5.19

5-17. PRINTED WIRING BOARD – VCR SECTION –

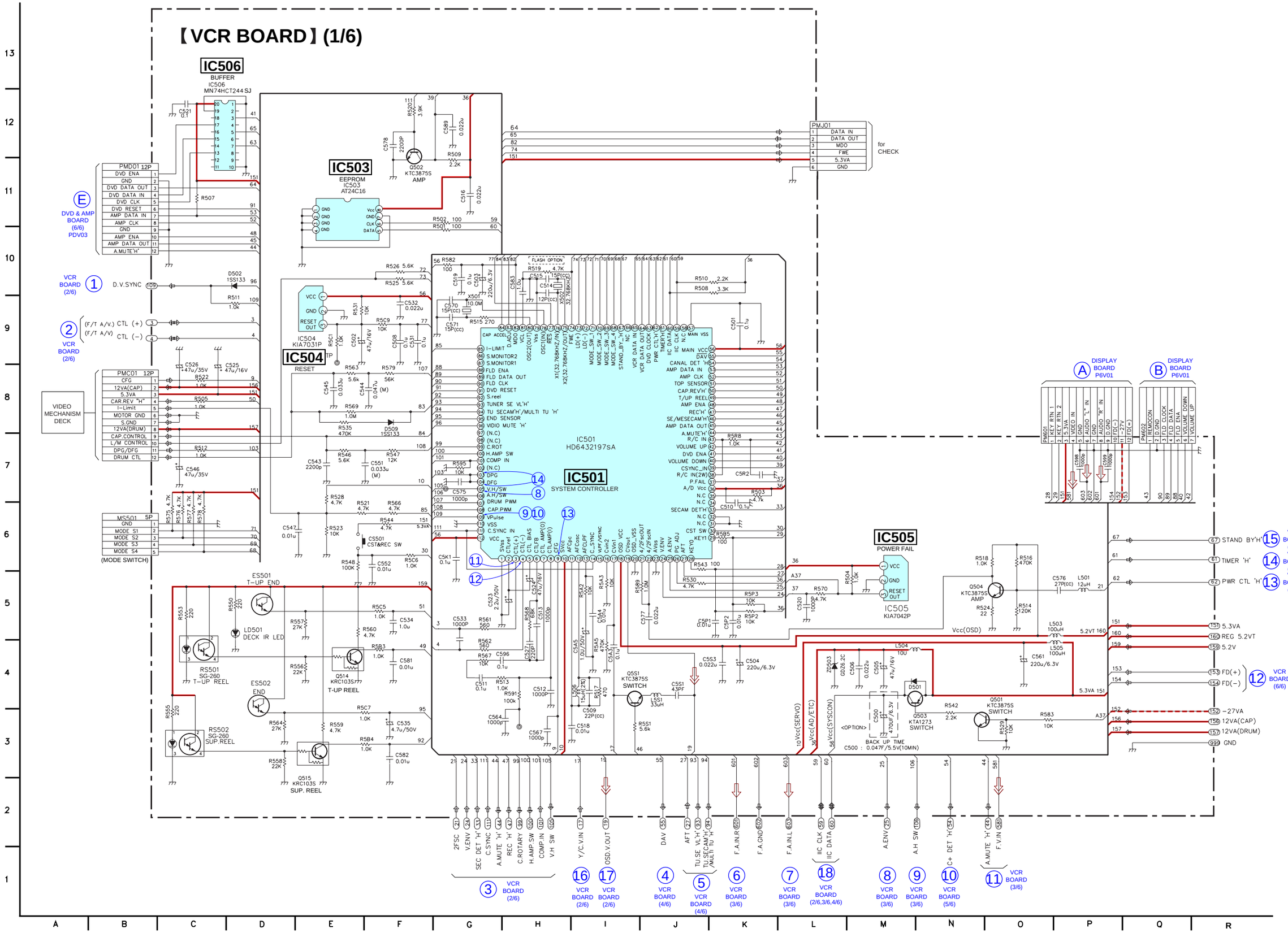
• See page 51 for Circuit Boards Location.



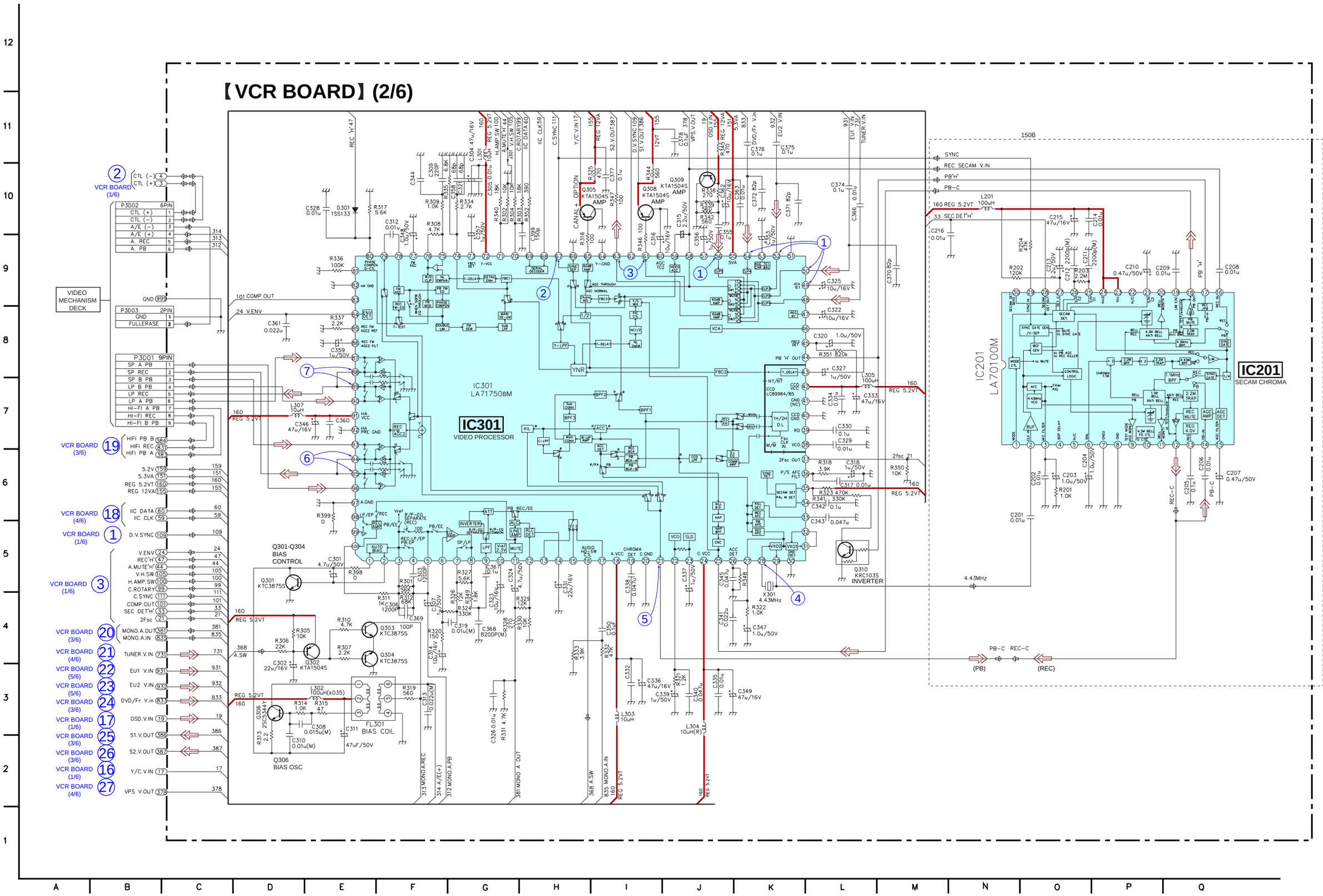
- **Semiconductor Location**

Ref. No.	Location
D161	K-6
D163	J-5
D509	F-16
IC160	J-6
IC161	K-6
IC162	J-6
IC201	J-9
IC301	F-10
IC501	F-15
IC503	K-15
IC504	H-16
IC505	I-14
IC506	C-13
IC751	J-3
IC7V1	I-16
IC801	F-7
IC802	C-4
Q161	J-4
Q162	J-4
Q163	K-4
Q164	K-3
Q166	L-6
Q167	K-6
Q168	J-5
Q169	L-6
Q301	G-8
Q302	G-8
Q303	G-8
Q304	G-9
Q305	E-11
Q306	H-8
Q308	C-7
Q309	E-12
Q310	G-11
Q501	J-14
Q502	H-13
Q503	J-14
Q504	F-13
Q514	I-14
Q515	E-14
Q5S1	D-14
Q804	D-5
Q904	D-4
Q905	D-4
Q906	C-3

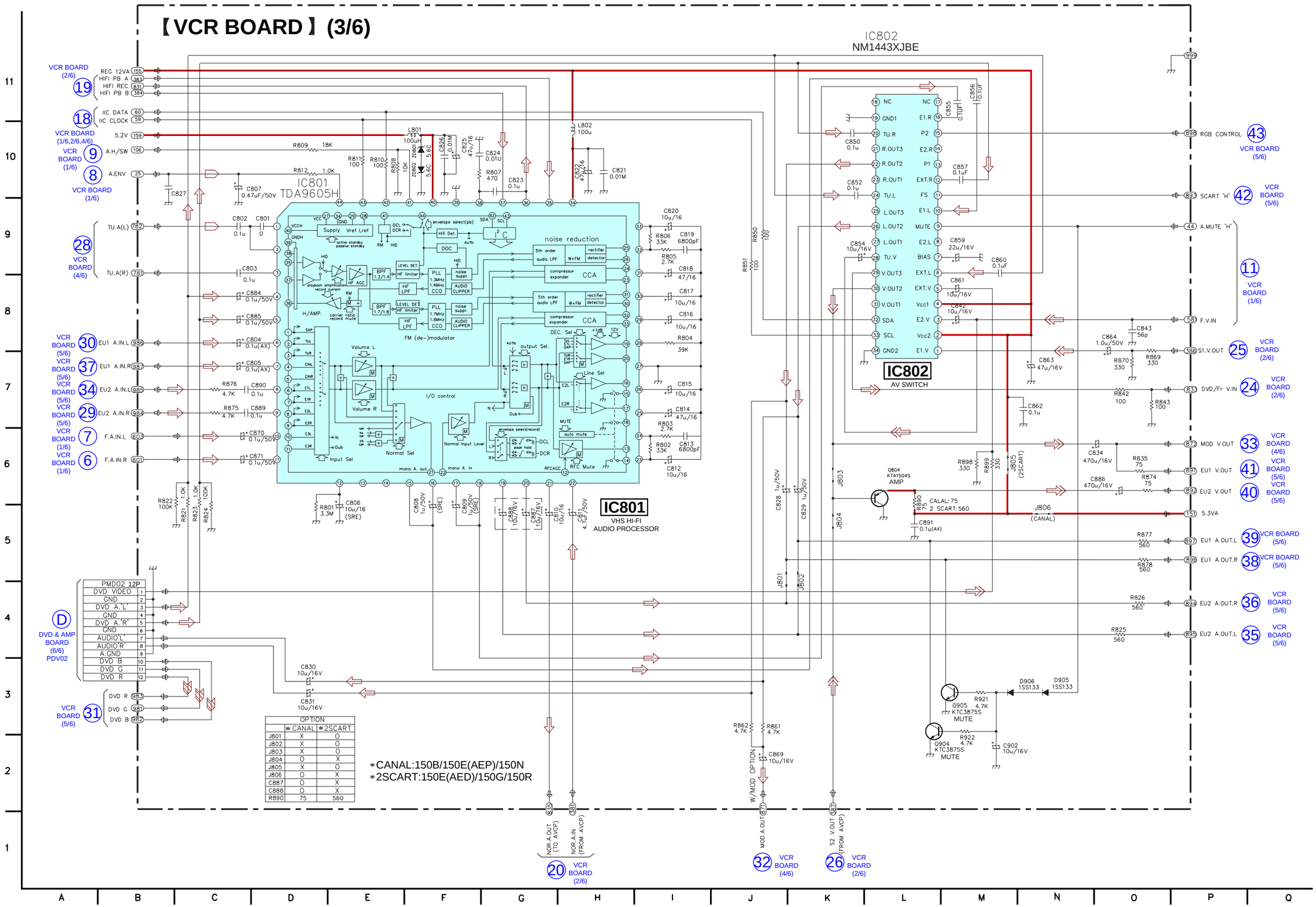
5-18. SCHEMATIC DIAGRAM – VCR SYSTEM SECTION – [VCR BOARD] (1/6)



5-19. SCHEMATIC DIAGRAM – AVCP/SECAM SECTION – [VCR BOARD] (2/6)

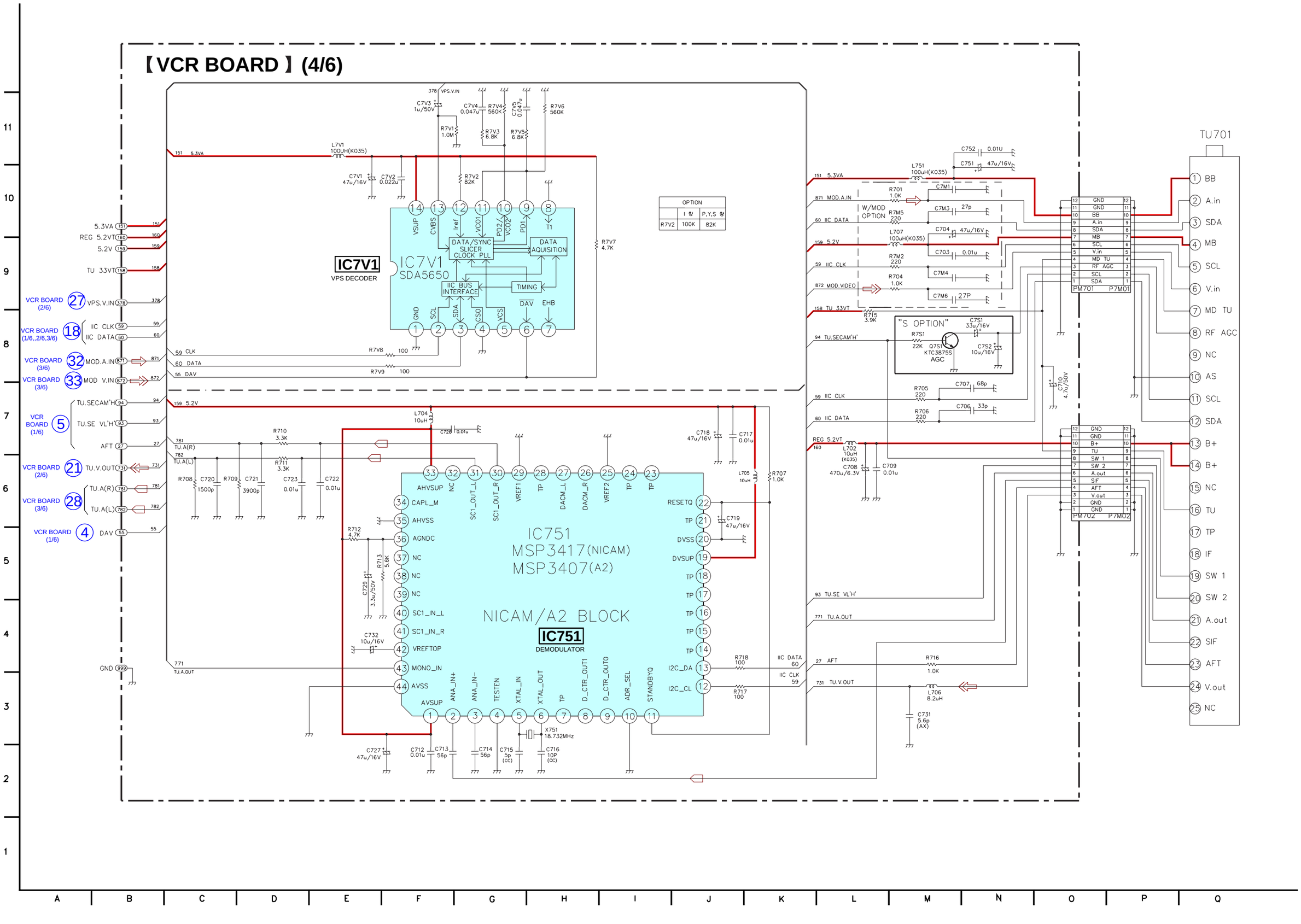


5-20. SCHEMATIC DIAGRAM – HI-FI/SWITCH SECTION– [VCR BOARD] (3/6)

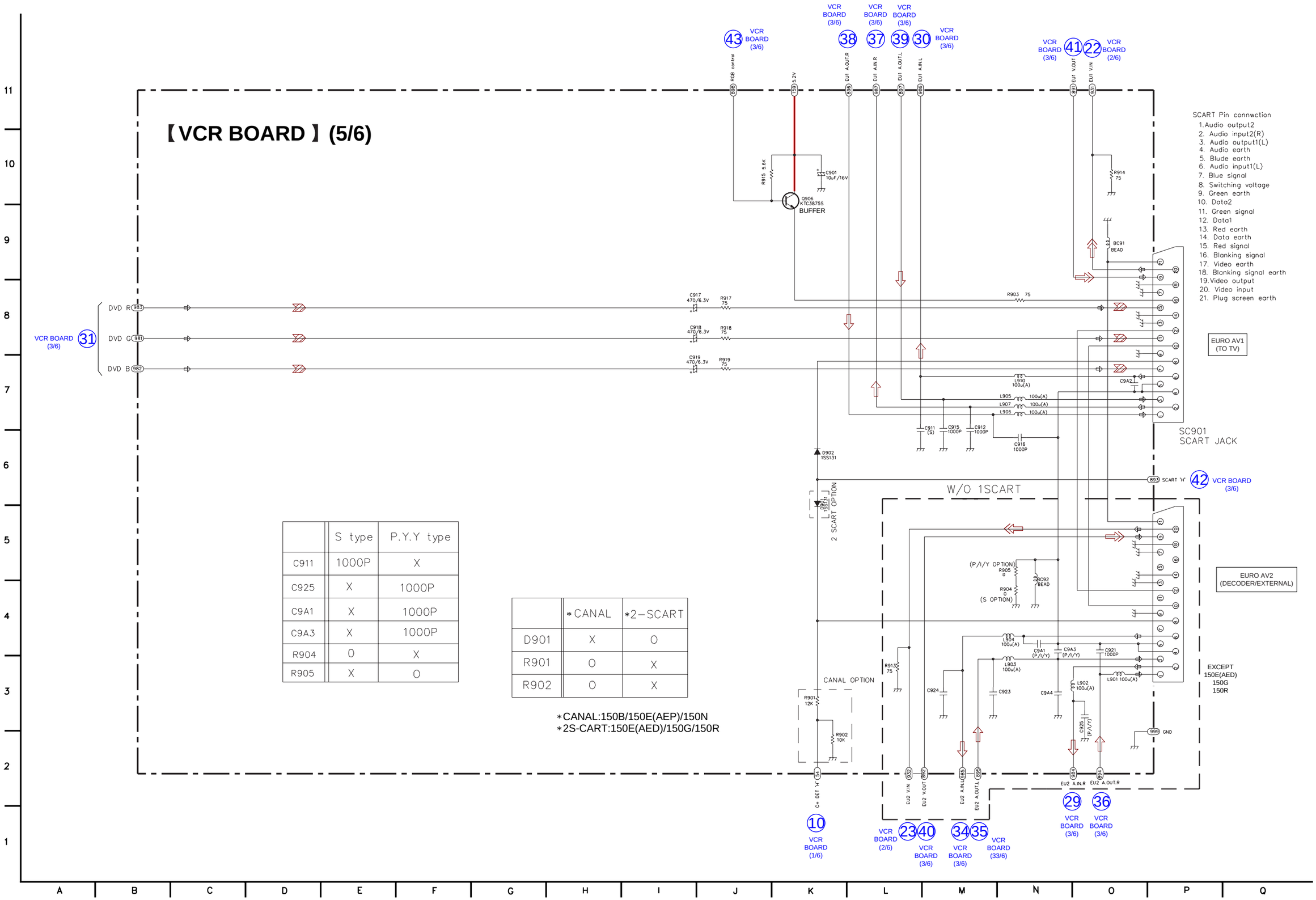


OPTION	*CANAL	*2SCART
J801	X	O
J802	X	O
J803	X	O
J804	O	X
J805	X	O
J806	O	X
C887	O	X
C888	O	X
R890	75	560

5-21. SCHEMATIC DIAGRAM – TUIF/NICAM/VPS SECTION – [VCR BOARD] (4/6)



5-22. SCHEMATIC DIAGRAM – SCART/SWITCH SECTION – [VCR BOARD] (5/6)

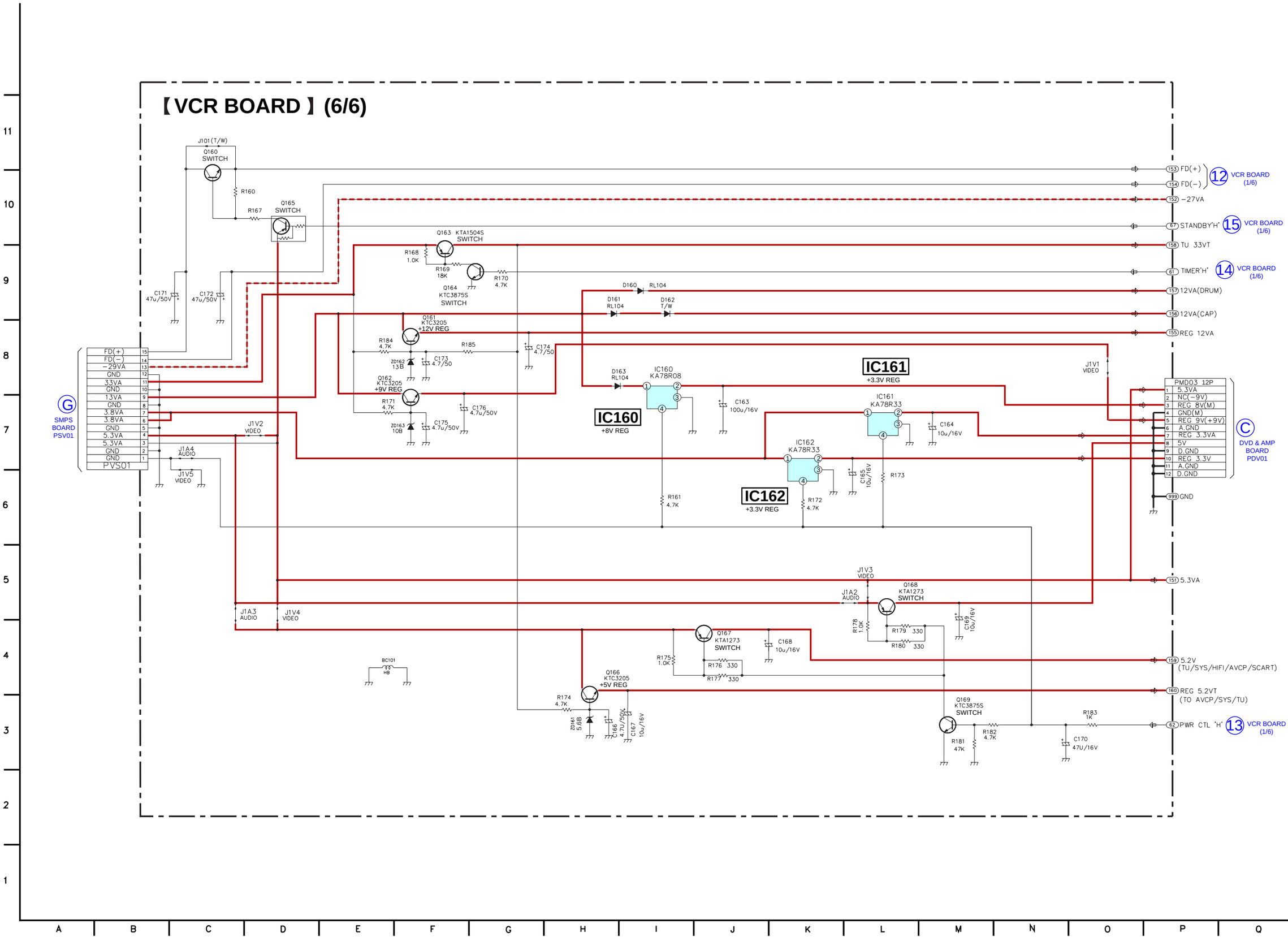


	S type	P.Y.Y type
C911	1000P	X
C925	X	1000P
C9A1	X	1000P
C9A3	X	1000P
R904	0	X
R905	X	0

	*CANAL	*2-SCART
D901	X	0
R901	0	X
R902	0	X

*CANAL:150B/150E(AEP)/150N
*2S-CART:150E(AED)/150G/150R

5-23. SCHEMATIC DIAGRAM – VCR POWER SECTION – [VCR BOARD] (6/6)



• **VOLTAGE CHART (VCR BOARD)**

Pin No.	Voltage
IC160	
1	12.3
2	8
3	0
4	0
IC161	
1	3.8
2	3.3
3	0
4	0
IC162	
1	3.8
2	3.3
3	0
4	0
IC201	
1	-
2	2.4
3	3.6
4	-
5	-
6	3.7
7	0
8	0
9	-
10	-
11	-
12	1
13	4
14	2.6
15	2
16	3.6
17	4
18	2.2
19	3.6
20	-
21	0
22	-
23	4.9
24	4.9
25	2.9
26	2.9
27	3.1
28	0
29	0.7
30	-
IC301	
1	5
2	0
3	2.2
4	0
5	0
6	2.2

Pin No.	Voltage
7	0
8	2.2
9	2.1
10	0
11	2.3
12	0
13	-
14	0
15	-
16	0
17	0
18	5
19	0
20	0
21	1.9
22	0
23	0
24	5
25	3.3
26	2.4
27	2
28	0
29	2.6
30	0
31	4.9
32	4.9
33	2.4
34	1.5
35	2.3
36	2
37	1.8
38	2
39	9.2
40	0
41	0
42	5
43	2.5
44	4
45	2
46	2.7
47	4
48	3.8
49	2.9
50	2.3
51	-
52	3.1
53	2.2
54	0
55	5.2
56	5.2
57	3.5
58	0
59	0

Pin No.	Voltage
60	1.5
61	1.5
62	0
63	0
64	0
65	1.7
66	0
67	0
68	4.8
69	4.7
70	2.5
71	1.8
72	5
73	1.7
74	2.8
75	0.6
76	0.7
77	0
78	3.3
79	1.9
80	1.9
81	1.3
82	0
83	2.1
84	0.5
85	0
86	0.4
87	1.9
88	1.9
89	1.9
90	0
91	5
92	0
93	0.7
94	0
95	0
96	0
97	0
98	-
99	-
100	2.2
IC501	
1	0
2	0.3
3	2
4	2.5
5	2.5
6	2.5
7	2.7
8	2.4
9	0.4
10	5.2
11	1.8

Pin No.	Voltage
12	1.8
13	2.4
14	4.1
15	-
16	0
17	3.3
18	5
19	2.3
20	0
21	2.4
22	2.5
23	0
24	0.8
25	0
26	5.2
27	4.1
28	2.5
29	0
30	1.9
31	0
32	0
33	0
34	-
35	5.1
36	5.1
37	0
38	3
39	0
40	0
41	0
42	4.9
43	0
44	0
45	5
46	0
47	0
48	4.9
49	0
50	0
51	4.2
52	5.1
53	2
54	0
55	5.2
56	5.1
57	0
58	-
59	0
60	5.1
61	5.1
62	5.1
63	5.1
64	5.1

Pin No.	Voltage
65	5.1
66	-
67	0
68	0
69	0
70	5.1
71	5.1
72	0
73	5.1
74	0
75	2.4
76	2.5
77	4.9
78	2.5
79	0
80	2.5
81	3.3
82	5.1
83	2.4
84	0
85	0
86	-
87	-
88	5.1
89	5.1
90	5.1
91	2.7
92	5
93	0
94	0
95	0
96	0
97	-
98	-
99	0
100	0
101	0
102	-
103	2.4
104	2.4
105	0
106	0
107	0
108	0
109	0
110	0
111	4
112	5.1
IC503	
1	0
2	0
3	0
4	0

Pin No.	Voltage
5	5.1
6	5.1
7	0
8	5.2
IC504	
1	5.1
2	0
3	5.1
IC505	
1	5.1
2	0
3	4.8
IC506	
1	0
2	-
3	2.2
4	-
5	5.1
6	-
7	5.1
8	-
9	-
10	0
11	-
12	-
13	0
14	-
15	3.8
16	-
17	1.3
18	-
19	0
20	5.1
IC751	
1	5.1
2	1.5
3	1.5
4	-
5	2.5
6	2.5
7	-
8	-
9	-
10	0
11	5.1
12	4.8
13	4.8
14	-
15	-
16	-
17	-
18	-
19	5.1

Pin No.	Voltage
20	0
21	-
22	5.1
23	-
24	-
25	0
26	-
27	-
28	-
29	0
30	2.8
31	2.7
32	-
33	5.1
34	-
35	0
36	2.8
37	-
38	-
39	-
40	-
41	-
42	2.6
43	2.3
44	0
IC7V1	
1	0
2	4.8
3	4.7
4	0
5	-
6	5.1
7	-
8	0
9	0
10	0.4
11	0
12	1.5
13	1.7
14	5.1
IC801	
1	3.8
2	3.8
3	3.8
4	3.8
5	3.8
6	5.2
7	5.5
8	5.2
9	5.2
10	5.2
11	5.2
12	0

Pin No.	Voltage
13	-
14	-
15	0
16	6.1
17	8.1
18	0
19	8.1
20	8.1
21	4.6
22	3.8
23	3.8
24	3.8
25	3.8
26	0.8
27	0
28	3.8
29	2.8
30	0.8
31	3.8
32	3.8
33	3.8
34	11.8
35	0.3
36	2.8
37	0.3
38	0
39	0
40	5.1
41	0
42	5.1
43	5.1
44	0
IC802	
1	3.3
2	11.9
3	2.7
4	11.9
5	3
6	5.5
7	5.6
8	-
9	0
10	5.4
11	11.4
12	5.5
13	-
14	-
15	0
16	5.4
17	-
18	-
19	0
20	5.4

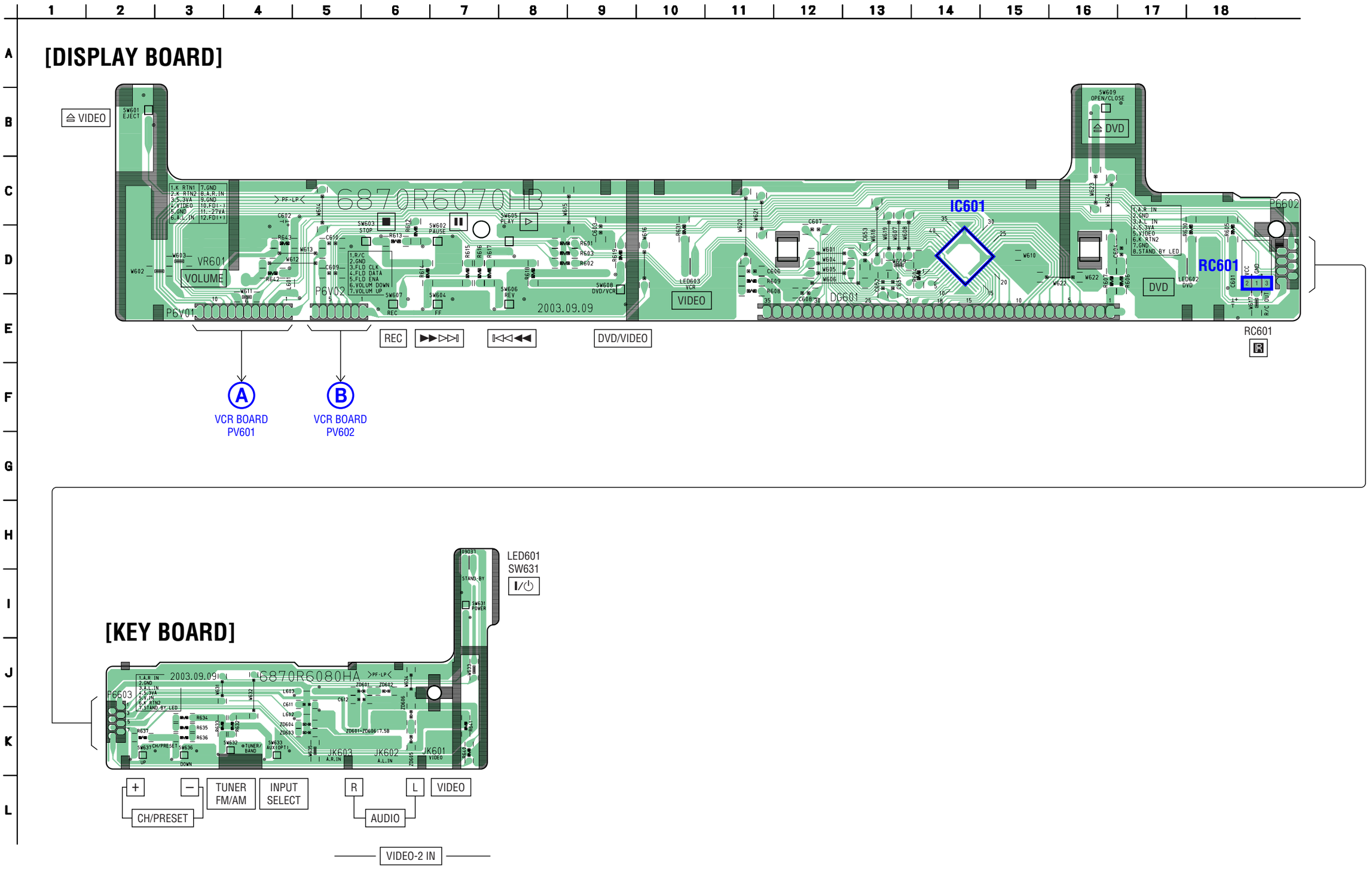
Pin No.	Voltage
21	-
22	5.7
23	-
24	5.5
25	-
26	5.7
27	-
28	0
29	1.4
30	2.4
31	-
32	5.1
33	0
34	0

Location No.	Base	Emitter	Collector
Q161	13	12	13
Q162	10	9	13
Q163	32.6	33	33
Q164	0.6	0	0
Q166	5.6	5.2	5.3
Q167	5	5.3	5.2
Q168	5	5.3	5
Q169	0.6	0	0
Q301	0	0	5
Q302	4.3	5	5
Q303	0	0	0
Q304	0.7	0	0
Q305	A2.1	2.8	0
Q306	5	5	5
Q308	2.5	3.2	0
Q309	0	3.6	0
Q310	4	0	0
Q501	0	0	0
Q502	0.7	0	0
Q503	4.5	5.2	5.1
Q504	-2.1	0	3.3
Q5S1	0	3.8	1.5
Q514	0	0	5
Q515	4.8	0	0
Q7S1	0	0	0
Q804	1.8	0	2.8
Q904	0	0	0
Q905	0	0	0
Q906	0	0	5.2

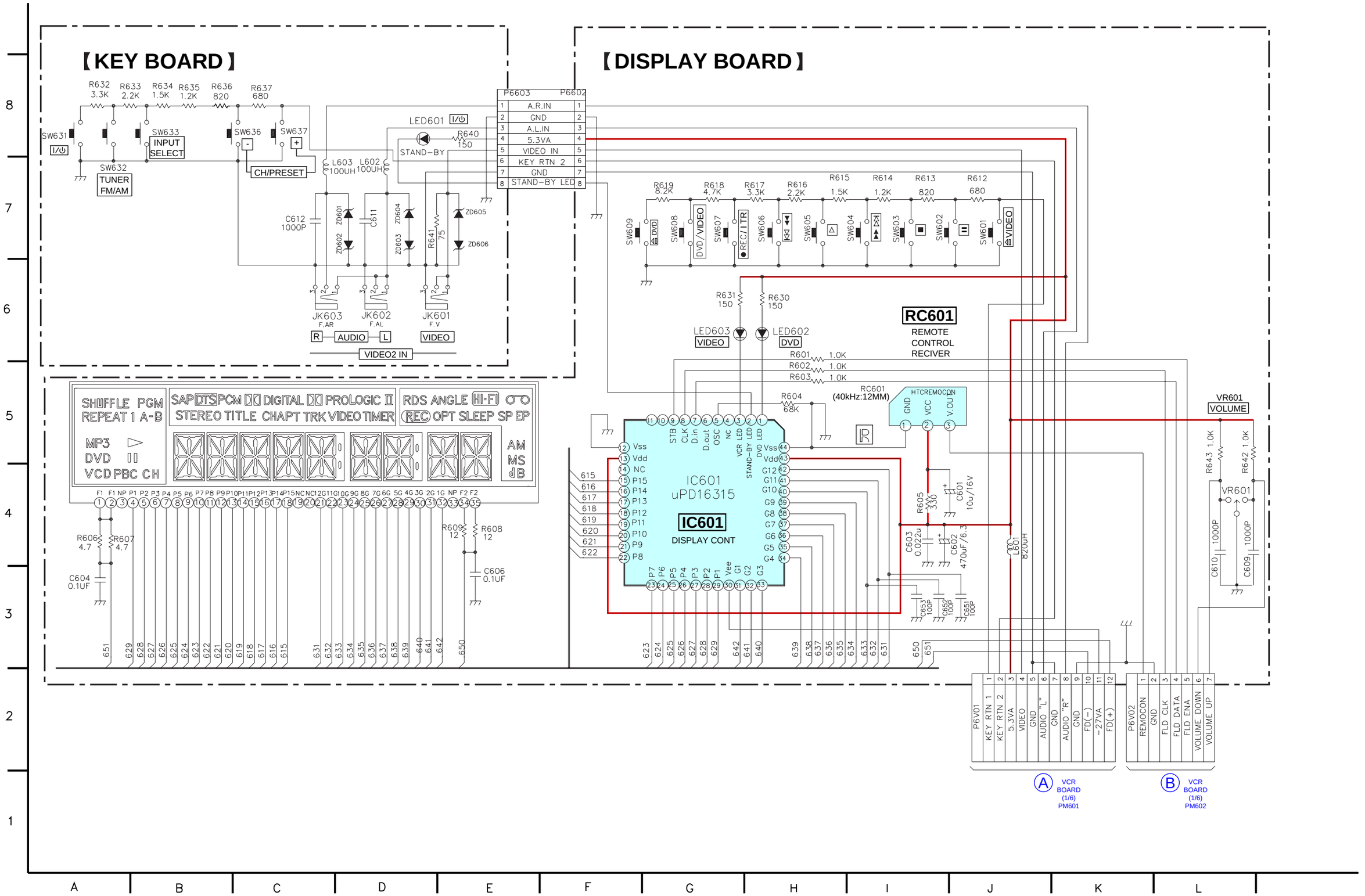
VOLTAGE : FM MODE

5-24. PRINTED WIRING BOARD – DISPLAY/KEY SECTION –

• See page 51 for Circuit Boards Location.

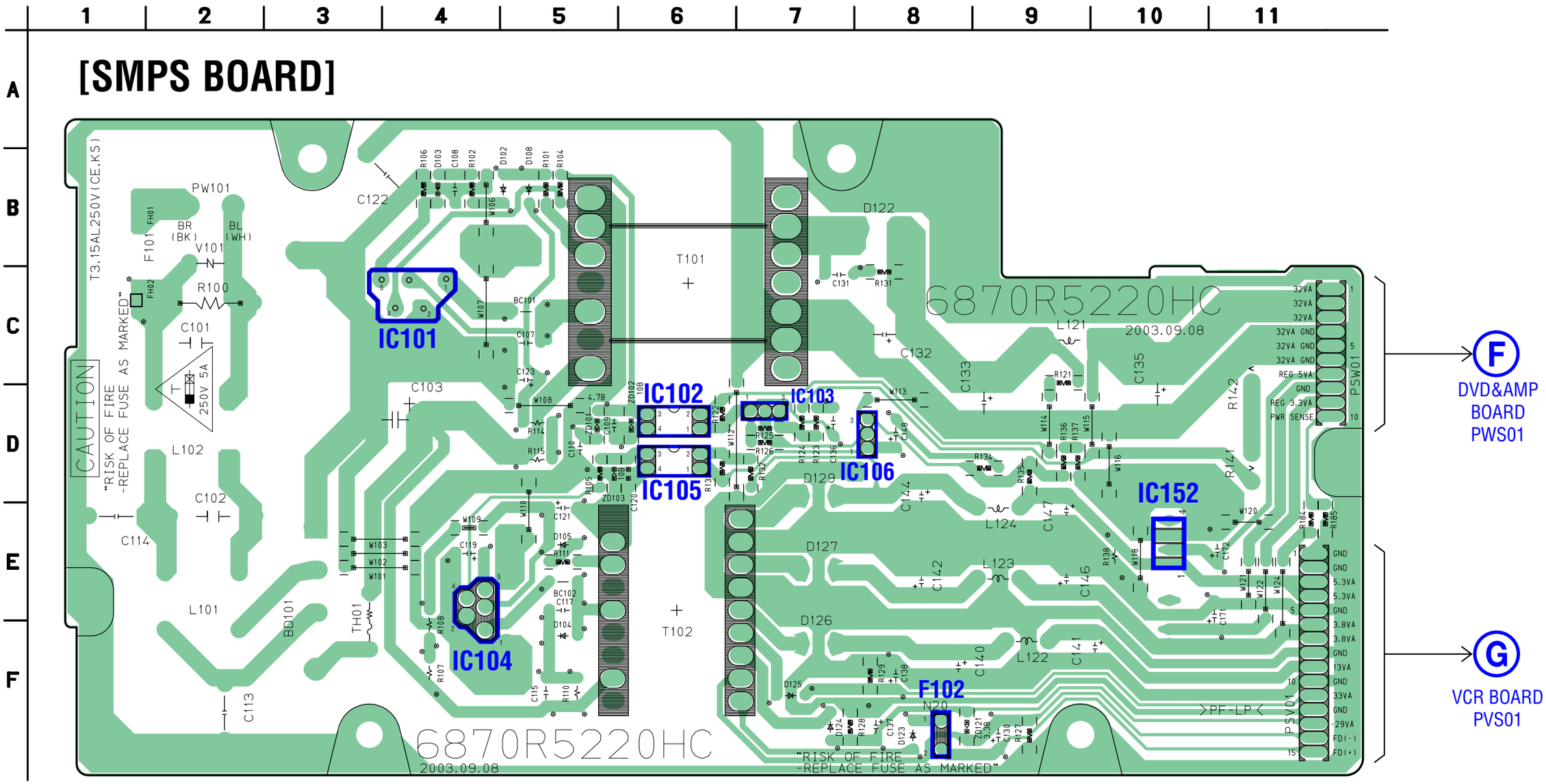


5-25. SCHEMATIC DIAGRAM – DISPLAY/KEY SECTION –



5-26. PRINTED WIRING BOARD – SMPS SECTION – • See page 51 for Circuit Boards Location.

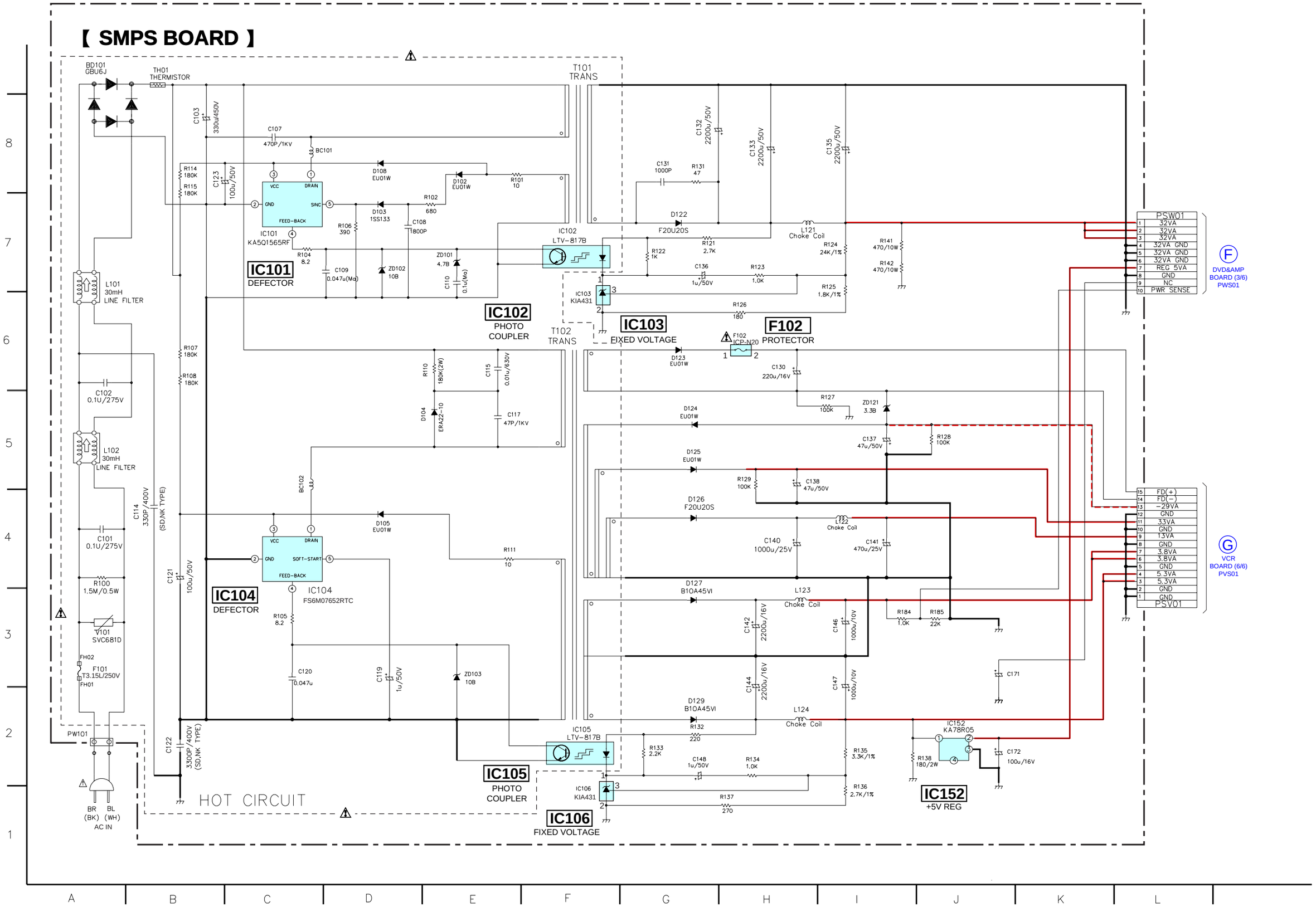
[SMPS BOARD]



- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
BD101	F-3	D108	B-5	D127	E-7	IC102	D-6
		D122	B-8	D129	D-7	IC103	D-7
D102	B-5	D123	F-8			IC104	E-4
D103	B-4	D124	F-7	F102	F-8	IC105	D-6
D104	F-5	D125	F-7			IC106	D-8
D105	E-5	D126	F-7	IC101	C-4	IC152	E-10

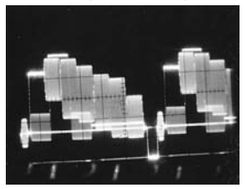
5-27. SCHEMATIC DIAGRAM – SMPS SECTION –



- **Waveforms**

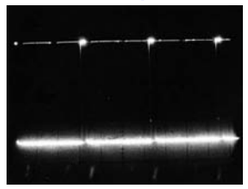
– VCR Board –

① **IC301 ㊽, ㊿, ㊿②, ㊿④, ㊿⑥**
EE (VIDEO IN)



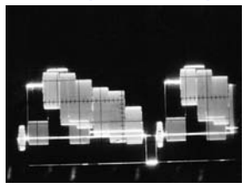
200 mV/10 msec DIV

② **IC301 ㊼**
PB/REC (C-SYNC OUT)



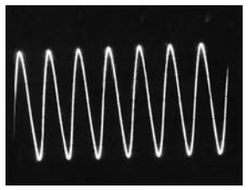
1.0 V/20 msec DIV

③ **IC301 ㊶, ㊸**
EE (VIDEO OUT)



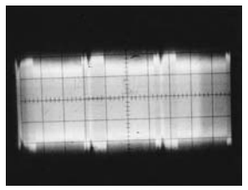
500 mV/10 msec DIV

④ **IC301 ㉘**
PB/REC (4.43MHz X-TAL IN)



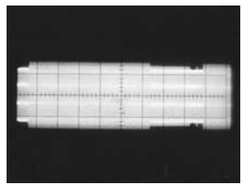
100 mV/200 nsec DIV

⑤ **IC301 ㉑**
PB (PB RF OUT)



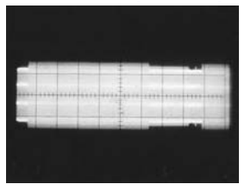
100 mV/5 msec DIV

⑥ **IC301 ㊹, ㊺**
SP REC (REC RF)



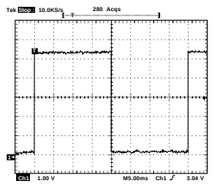
500 mV/2 msec DIV

⑦ **IC301 ㊽, ㊾**
LP REC (REC RF)



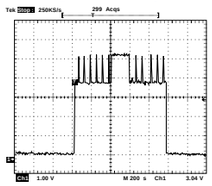
500 mV/2 msec DIV

⑧ **IC501 ㊺**
REC/PB (V.HSW)



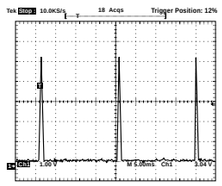
1.0 V/5 msec DIV

⑨ **IC501 ㊾**
QUE/REV (DV.SYNC)



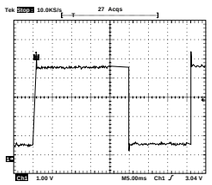
1 V/200 µsec DIV

⑩ **IC501 ㊾ QUE/REV (DV.SYNC)**
※UPPER WAVEFORM



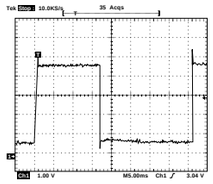
0.2 V/40 µsec DIV

⑪ **IC501 ③**
(CTL +)



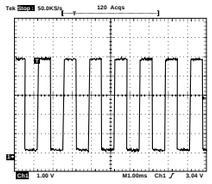
1 V/5 msec DIV

⑫ **IC501 ④**
(CTL –)



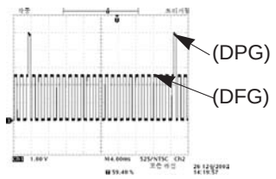
1 V/5 msec DIV

⑬ **IC501 ⑨**
REC/PB (CFG)



1 V/10 msec DIV

⑭ **IC501 ㊷, ㊹**
REC/PB (DPG/DFG)



1 V/10 msec DIV

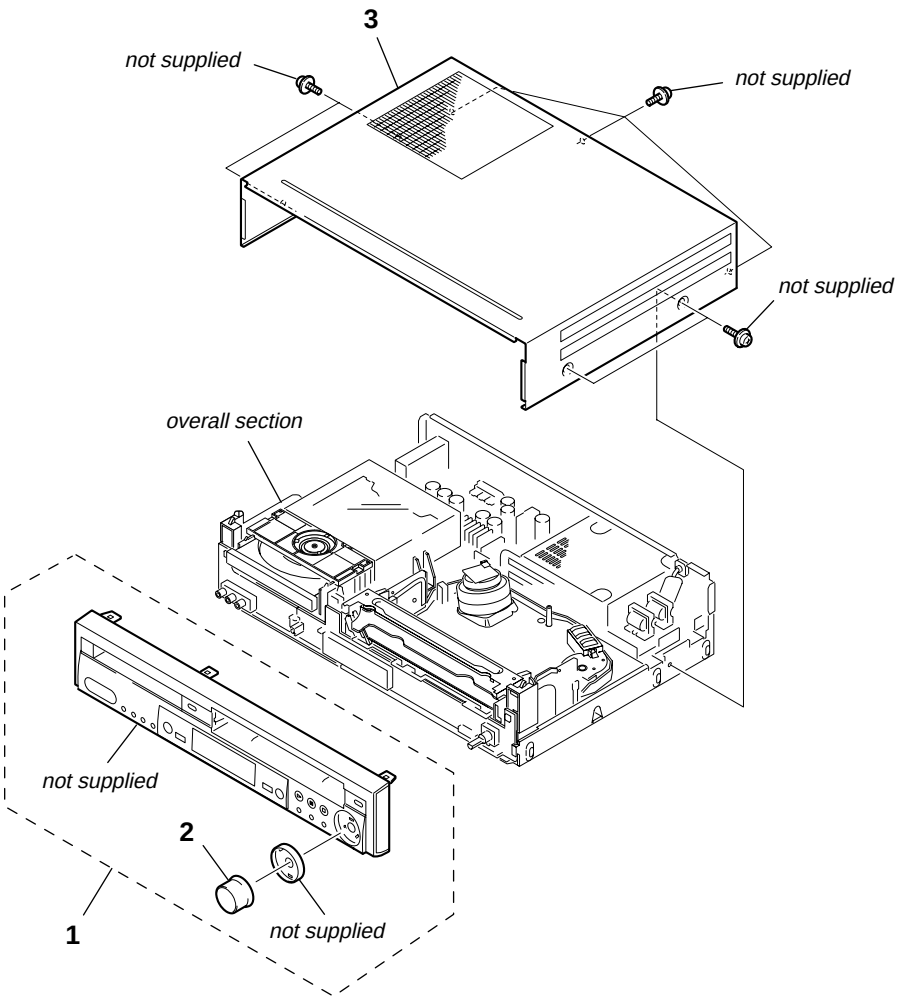
SECTION 6
EXPLODED VIEWS

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Abbreviation
  AED : North European model
  RU : Russian model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

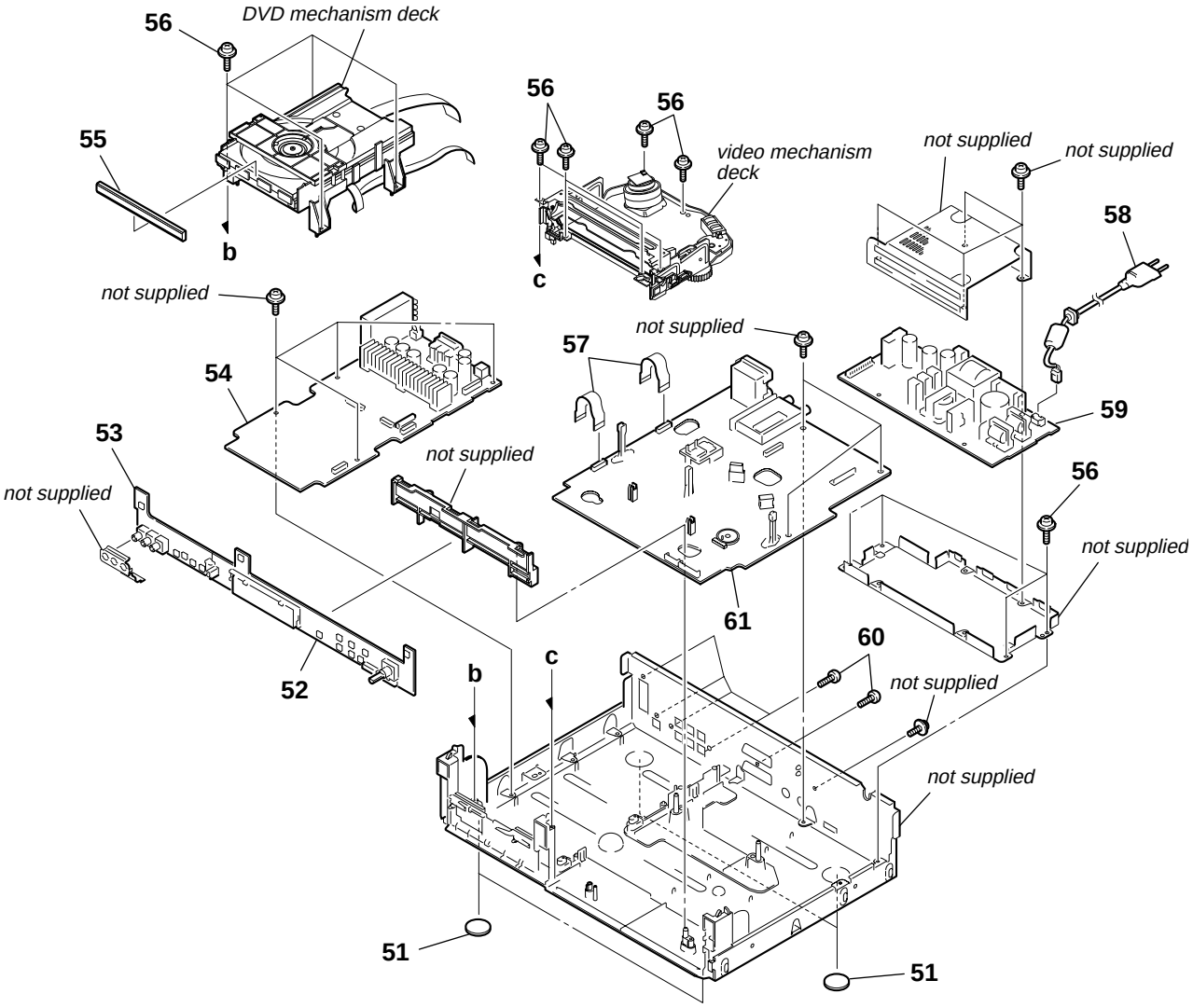
6-1. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	9-885-062-72	PANEL ASSEMBLY,FRONT (150E)	
1	9-885-062-84	PANEL ASSEMBLY,FRONT (150N)	
1	9-885-062-64	PANEL ASSEMBLY,FRONT (150B)	
1	9-885-062-79	PANEL ASSEMBLY,FRONT (150G)	

Ref. No.	Part No.	Description	Remark
1	9-885-062-89	PANEL ASSEMBLY,FRONT (150R)	
2	9-885-055-34	KNOB,VOLUME	
3	9-885-055-32	CASE	

6-2. OVERALL SECTION

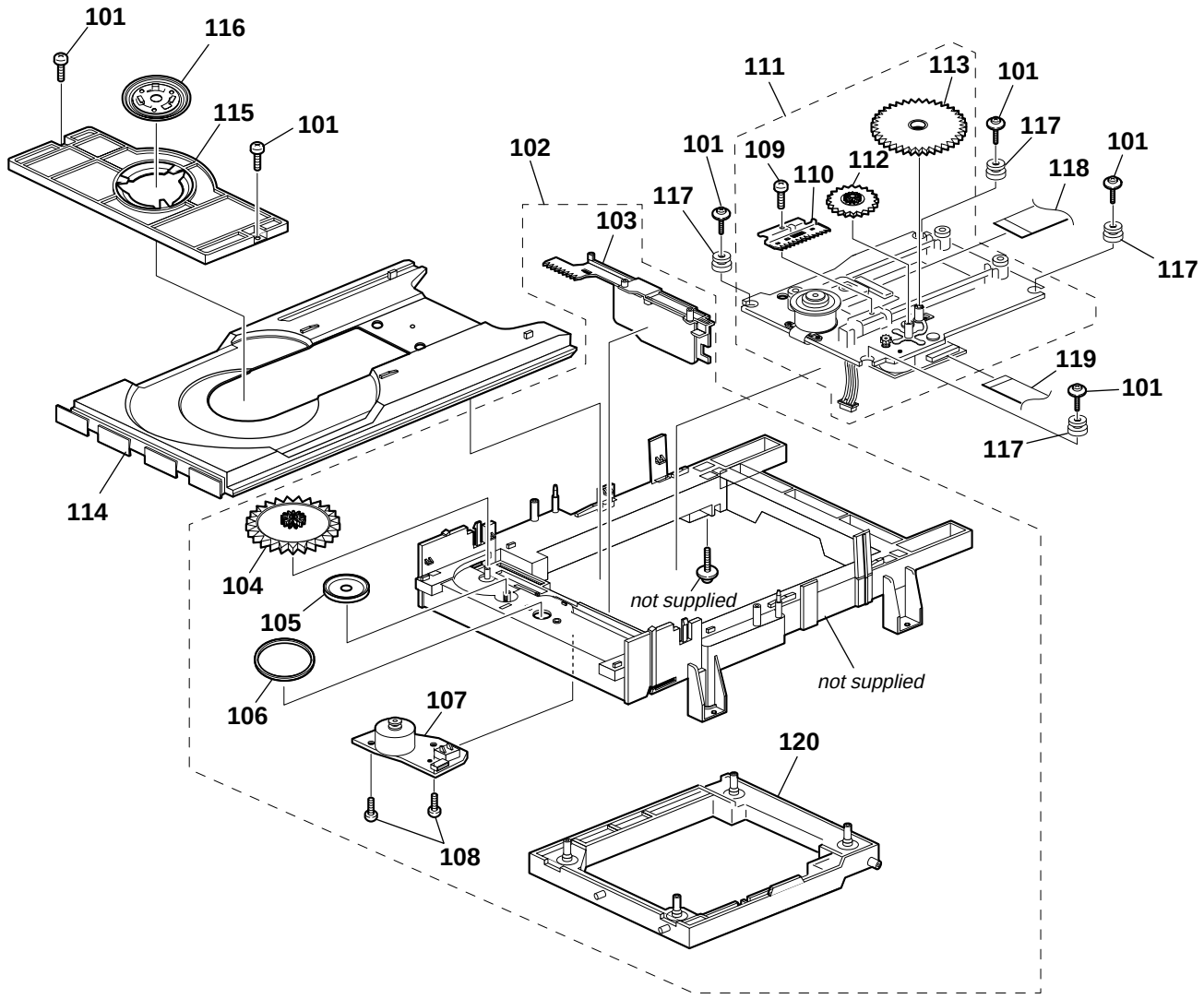


Ref. No.	Part No.	Description	Remark
51	9-885-055-38	RUBBER,FOOT	
52	9-885-055-48	DISPLAY BOARD, COMPLETE	
53	9-885-055-49	KEY BOARD, COMPLETE	
54	9-885-062-74	DVD & AMP BOARD, COMPLETE (150E)	
54	9-885-062-86	DVD & AMP BOARD, COMPLETE (150N)	
54	9-885-062-68	DVD & AMP BOARD, COMPLETE (150B)	
54	9-885-062-82	DVD & AMP BOARD, COMPLETE (150G)	
54	9-885-062-91	DVD & AMP BOARD, COMPLETE (150R)	
55	9-885-062-62	DOOR,CASE (DVD)	
56	9-885-034-51	SCREW SPECIAL (3X12)	
57	9-885-055-44	FFC,12CORE 1.25 60mm SHIELD	

Ref. No.	Part No.	Description	Remark
⚠58	9-885-062-81	CORD, POWER (150G)	
⚠58	9-885-062-66	CORD, POWER (EXCEPT 150G)	
59	9-885-062-67	SMPS BOARD, COMPLETE	
60	9-885-039-85	SCREW SPECIAL (3X10)	
61	9-885-062-75	VCR BOARD, COMPLETE (150E(AEP))	
61	9-885-062-77	VCR BOARD, COMPLETE (150E(AED))	
61	9-885-062-87	VCR BOARD, COMPLETE (150N)	
61	9-885-062-69	VCR BOARD, COMPLETE (150B)	
61	9-885-062-83	VCR BOARD, COMPLETE (150G)	
61	9-885-062-87	VCR BOARD, COMPLETE (150N)	
61	9-885-062-92	VCR BOARD, COMPLETE (150R)	

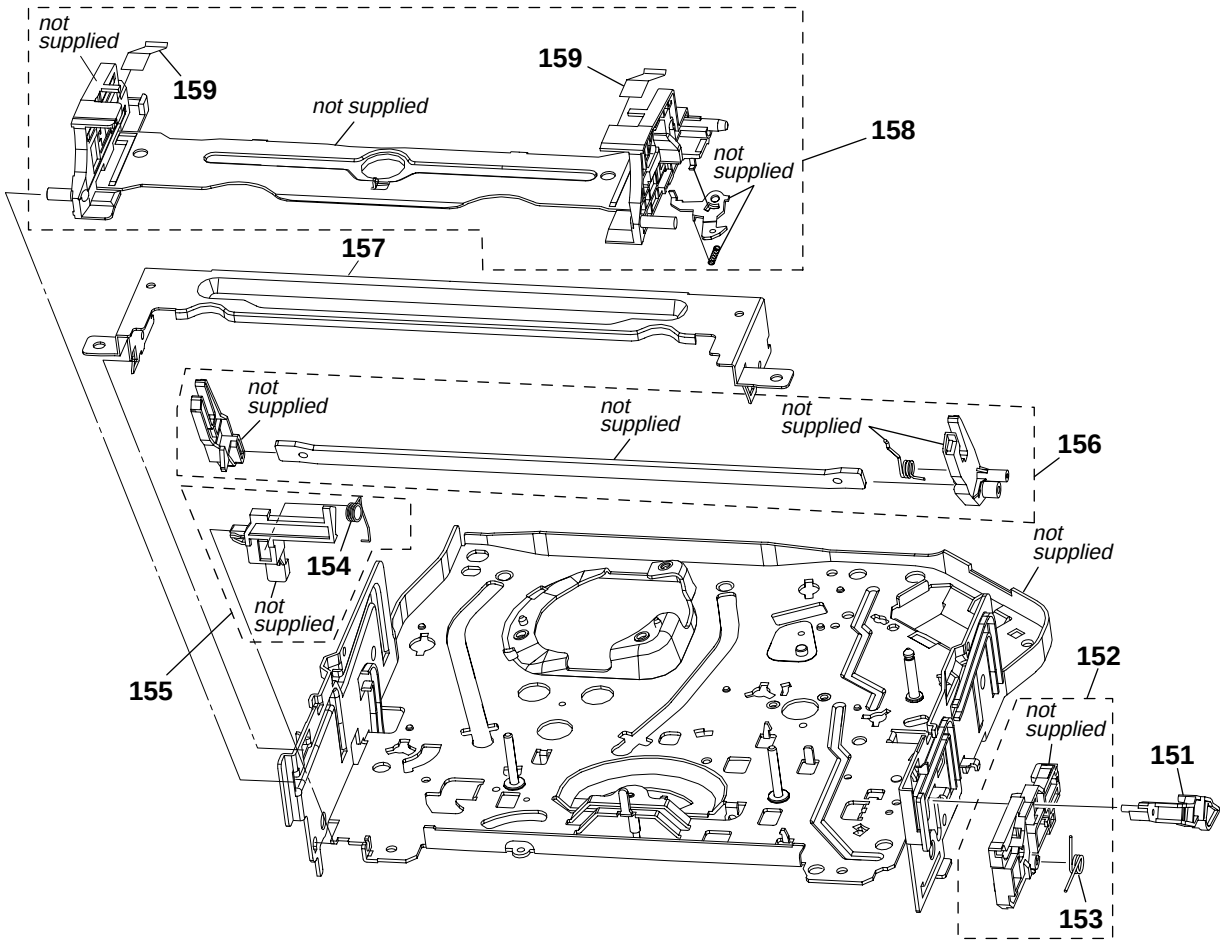
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

6-3. DVD MECHANISM DECK



Ref. No.	Part No.	Description	Remark
101	9-885-039-79	SCREW, B-TITE	
102	9-885-041-44	BASE ASSY, MAIN (DP-7C)	
103	9-885-040-08	GUIDE, UP/DOWN	
104	9-885-039-99	GEAR, LOADING	
105	9-885-056-19	GEAR, PULLEY	
106	9-885-056-18	BELT	
107	9-885-040-26	PWB (PCB) ASSY, OTHERS	
108	9-885-039-77	SCREW, DRAWING (SWERCH16A/ZNBK)	
109	9-885-039-78	SCREW, MACHINE	
110	9-885-039-95	GEAR ASSY	
111	9-885-041-45	BASE ASSY, SLED (DP-7C)	
112	9-885-039-97	GEAR, MIDDLE (DP-7C)	
113	9-885-039-96	GEAR, PINION (DP-7C)	
114	9-885-056-05	TRAY, DISC	
115	9-885-056-01	HOLDER, CLAMP	
116	9-885-056-07	CLAMP ASSY	
117	9-885-056-04	RUBBER, DAMPER (DP-7C)	
118	9-885-056-06	CABLE, FLAT (23 CORE)	
119	9-885-056-02	CABLE, FLAT (11 CORE)	
120	9-885-056-03	FRAME, UP/DOWN DP7C	

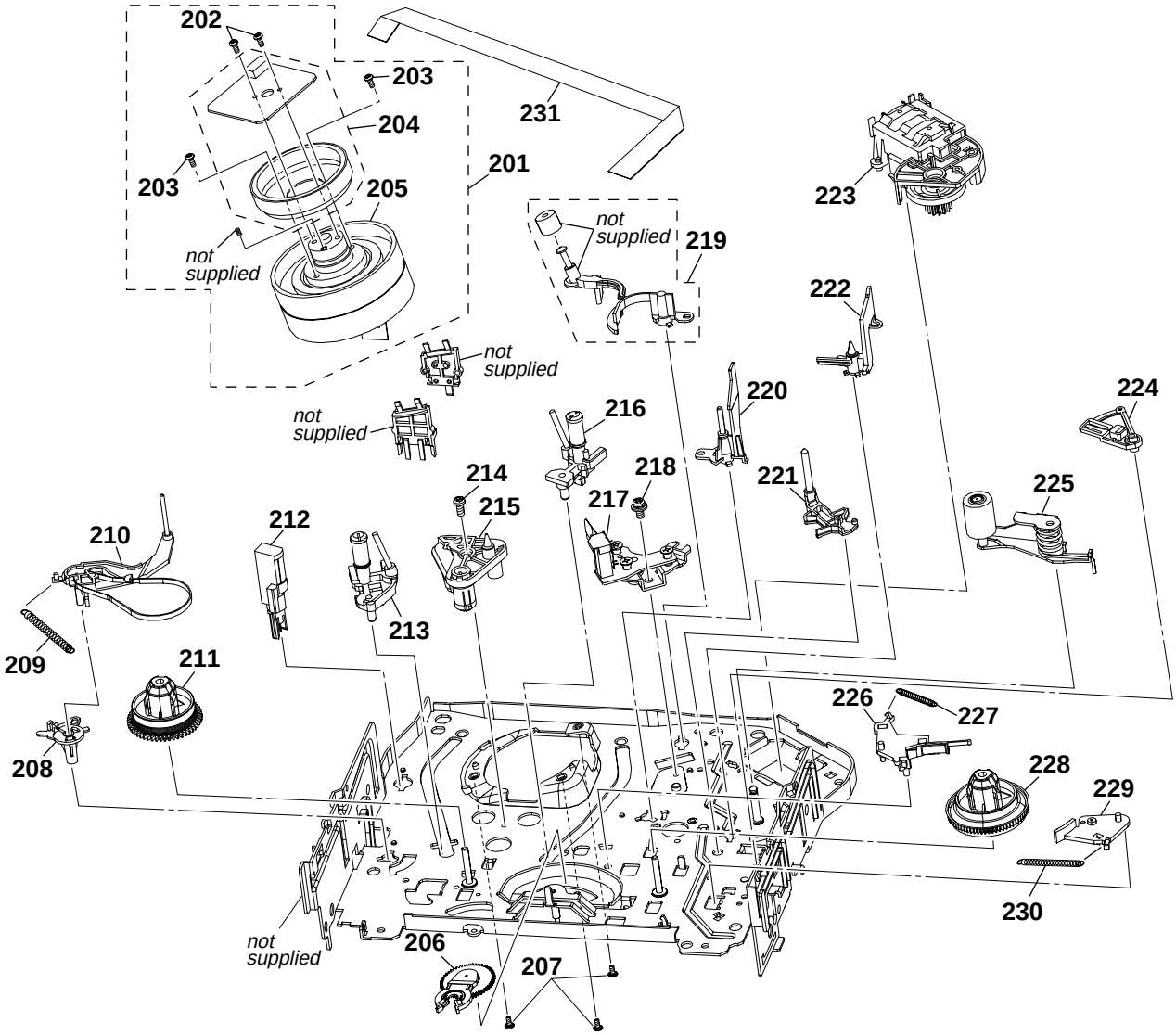
6-4. VIDEO MECHANISM DECK -1



Ref. No.	Part No.	Description	Remark
151	9-885-034-28	OPENER, DOOR	
152	9-885-034-71	GEAR ASSY, RACK (F/L)	
153	9-885-056-15	SPRING, COIL (D35)	
154	9-885-034-34	SPRING, COIL (D35 SWITCH)	
155	9-885-034-73	LEVER ASSY, SWITCH	

Ref. No.	Part No.	Description	Remark
156	9-885-034-72	ARM ASSY, F/L	
157	9-885-056-14	PLATE, TOP	
158	9-885-034-70	HOLDER ASSY, CST	
159	9-885-056-16	PLATE, SPRING CST	

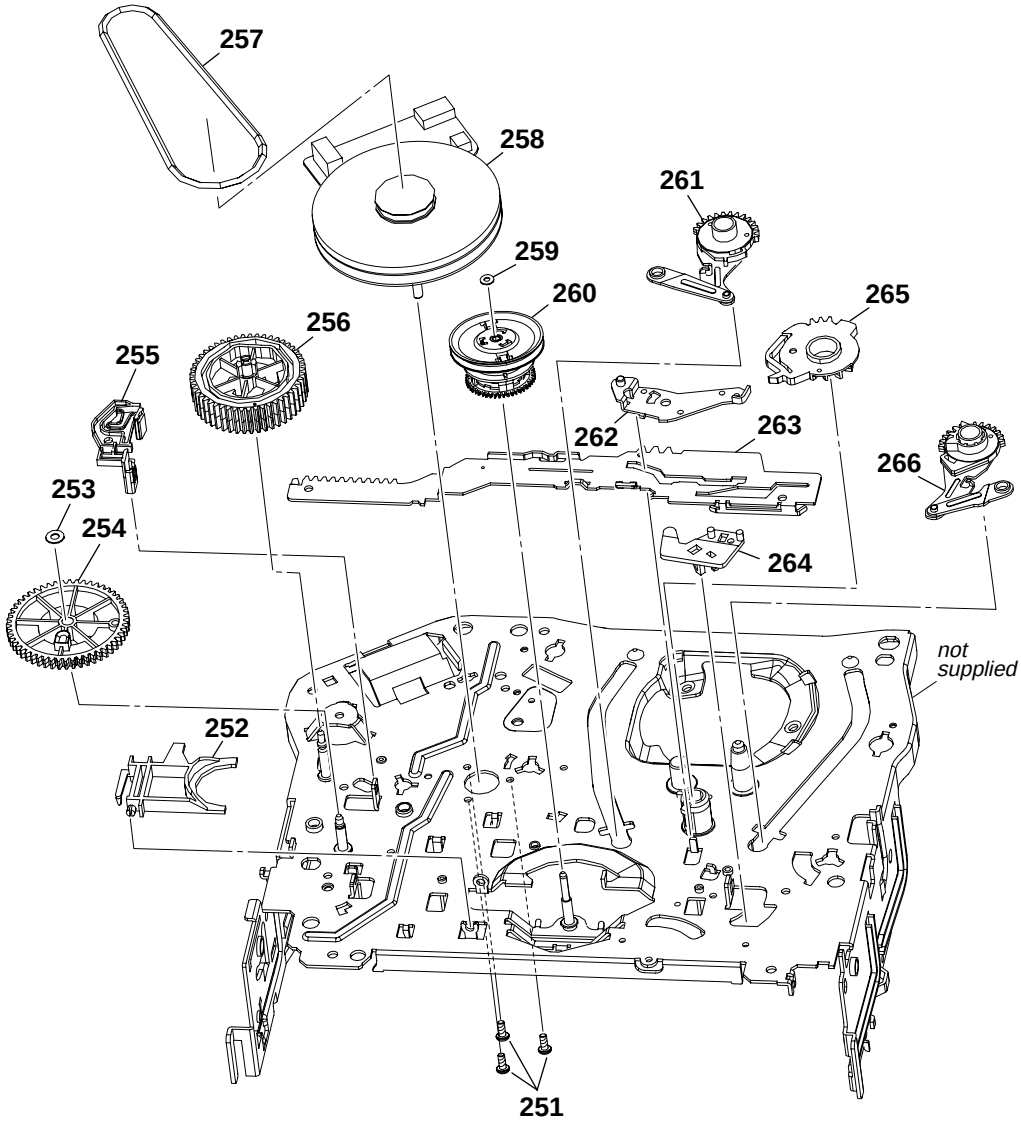
6-5. VIDEO MECHANISM DECK -2



Ref. No.	Part No.	Description	Remark
201	9-885-034-65	DRUM ASSY, D35-6CH PAL	
202	9-885-034-44	SCREW, D2.6 L4.5 MSWR3/FZY	
203	9-885-034-45	SCREW, D2.6 L4.0 MSWR3/FZY	
204	9-885-033-74	MOTOR, DRUM 120AL05	
205	9-885-040-03	MOTOR (MECH), DRUM MDVC-035AA	
206	9-885-056-11	ARM ASSY, IDLER	
207	9-885-034-47	SCREW, D3.0 L6.0 MSWR3/FZY	
208	9-885-034-21	BASE, TENSION	
209	9-885-034-02	SPRING COIL, TENSION	
210	9-885-033-82	ARM ASSY, TENSION	
211	9-885-033-88	REEL, S	
212	9-885-033-93	HEAD, D35 FE ST	
212	9-885-040-18	HEAD (CIRC), D35 FE TDK 6	
213	9-885-033-83	BASE ASSY, P2	
214	9-885-034-46	SCREW, D2.6 L5.8 SWRCH16A/FZY	
215	9-885-039-82	BASE ASSY, SLED (DP-5-4V)	

Ref. No.	Part No.	Description	Remark
216	9-885-033-84	BASE ASSY, P3	
217	9-885-033-87	BASE ASSY, A/C HEAD	
218	9-885-034-48	SCREW, D2.6 L5.0 SWRCH18A/FZY	
219	9-885-034-66	ARM ASSY, CLEANER	
220	9-885-033-85	BASE ASSY, P4	
221	9-885-033-80	ARM, T/UP	
222	9-885-033-86	OPENER, LID	
223	9-885-040-06	MOTOR ASSY (LOADING)	
224	9-885-034-01	LEVER, T/UP	
225	9-885-034-00	ARM ASSY, DECK/MECHA PINCH	
226	9-885-033-90	BRAKE ASSY, RS	
227	9-885-033-89	SPRING COIL, RS D35	
228	9-885-033-99	REEL, T	
229	9-885-033-92	BRAKE ASSY, T	
230	9-885-033-91	SPRING COIL, D35	
231	9-885-056-10	CABLE, FLAT (7 CORE)	

6-6. VIDEO MECHANISM DECK -3



Ref. No.	Part No.	Description	Remark
251	9-885-034-49	SCREW, D2.6 L6.8 MSWR3/FZY	
252	9-885-034-10	LEVER, F/R	
253	9-885-034-54	WASHER, STOPPER	
254	9-885-034-07	GEAR, DRIVE	
255	9-885-034-09	BRAKE ASSY, CAPSTAN	
256	9-885-034-08	GEAR, CAM	
257	9-885-034-04	BELT, CAPSTAN	
258	9-885-056-12	MOTOR, CAPSTAN	
259	9-885-034-53	WASHER, STOPPER	
260	9-885-056-13	CLUTCH ASSY, D35	
261	9-885-034-68	GEAR ASSY, P3	
262	9-885-034-20	LEVER, TENSION	
263	9-885-034-19	PLATE, SLIDER	
264	9-885-034-18	LEVER, SPRING	
265	9-885-034-12	GEAR, SECTOR (D35)	
266	9-885-034-69	GEAR ASSY, P2	

SECTION 7
ELECTRICAL PARTS LIST DISPLAY DVD & AMP

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- CAPACITORS
  uF: µF
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- Abbreviation
  AED : North European model
  RU : Russian model

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
	9-885-055-48	DISPLAY BOARD,COMPLETE	
		**********	
		< INDICATOR TUBE >	
DG601	9-885-055-97	INDICATOR TUBE, FLUORESCENT	
		< IC >	
IC601	8-759-643-83	IC UPD16315GB-3BS	
		< DIODE >	
LED602	9-885-055-98	DIODE, LED DL-11S2GNS (DVD)	
LED603	9-885-055-98	DIODE, LED DL-11S2GNS (VIDEO)	
		< CONNECTOR >	
P6V01	9-885-056-99	CONNECTOR,BOARD TO BOARD 12PIN	
P6V02	9-885-056-00	CONNECTOR,BOARD TO BOARD 7PIN	
PS602	1-816-678-11	CONNECTOR,BOARD TO BOARD 8PIN	
		< IC >	
RC601	1-478-247-11	REMOTE CONTROLLER RECEIVER (R)	
		< SWITCH >	
SW601	1-572-184-21	SWITCH,TACT (⏏ VIDEO)	
SW602	1-572-184-21	SWITCH,TACT (❚❚)	
SW603	1-572-184-21	SWITCH,TACT (■)	
SW604	1-572-184-21	SWITCH,TACT (▶▶▷▷❙)	
SW605	1-572-184-21	SWITCH,TACT (▷)	
SW606	1-572-184-21	SWITCH,TACT (❙◁◁◀◀)	
SW607	1-572-184-21	SWITCH,TACT (REC)	
SW608	1-572-184-21	SWITCH,TACT (DVD/VIDEO)	
SW609	1-572-184-21	SWITCH,TACT (⏏ DVD)	
		< ENCODER >	
VR601	9-885-055-02	ENCODER,VOLUME (VOLUME)	
**********			
	9-885-062-68	DVD & AMP BOARD,COMPLETE (150B)	
	9-885-062-74	DVD & AMP BOARD,COMPLETE (150E)	
	9-885-062-82	DVD & AMP BOARD,COMPLETE (150G)	
	9-885-062-86	DVD & AMP BOARD,COMPLETE (150N)	
	9-885-062-91	DVD & AMP BOARD,COMPLETE (150R)	
		**********	

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D501	6-500-323-01	DIODE RL104 R	
D603	8-719-991-34	DIODE 1SS133	
D604	8-719-991-34	DIODE 1SS133	
		<IC >	
IC101	9-885-055-65	IC LC875747B-52A5	
IC102	9-885-032-96	IC KIA7031P	
IC103	9-885-032-96	IC KIA7031P	
IC104	8-759-745-64	IC NJM4560M-TE1	
IC202	9-885-055-66	IC AK4586VQ	
IC203	8-759-297-77	IC MM1231XFBE	
IC204	8-759-656-83	IC NJM4580M	
IC205	8-759-745-64	IC NJM4560M-TE1	
IC206	9-885-055-67	IC CS4334-KS	
IC301	9-885-054-83	IC PS9702B	
IC401	9-885-041-57	IC MT1336E	
IC402	6-705-366-01	IC LA6560-A-TE	
IC501	9-885-055-68	IC MT1379DEC	
IC502	6-700-173-01	IC HY57V161610DTC-7	
IC503	6-700-173-01	IC HY57V161610DTC-7	
IC505	6-702-399-01	IC S524A40X21-SCT0	
IC507	9-885-041-64	IC MM1623XFBE	
IC5A1	9-885-062-95	IC PROGRAM, DTS60913S DVD (150B/150E)	
IC5A1	9-885-062-96	IC PROGRAM, DTS60913I DVD (150G)	
IC5A1	9-885-062-97	IC PROGRAM, DTS60913Y DVD (150N)	
IC5A1	9-885-062-99	IC PROGRAM, DTS60911X DVD (150R)	
IC710	9-885-054-79	IC STA505	
IC730	9-885-054-79	IC STA505	
IC750	9-885-054-79	IC STA505	
IC770	9-885-054-79	IC STA505	
		< JACK/TERMINAL >	
JK602	8-749-923-05	JACK, TORX178 (VIDEO 1)	
JKS01	1-694-998-11	TERMINAL BLOCK, 6P (SPEAKERS)	
		< CONNECTOR >	
PDV01	9-885-055-74	CONNECTOR,MA 12PIN WH	
PDV02	9-885-054-96	CONNECTOR,12PIN 1.25mm	
PDV03	9-885-054-96	CONNECTOR,12PIN 1.25mm	
PDM03	9-885-055-75	CONNECTOR,11P 1.0mm	
PDM01	9-885-055-76	CONNECTOR,23P 1.0mm	

DVD & AMP **KEY** **SMPS** **VCR**

Ref. No.	Part No.	Description	Remark
		< TUNER >	
PN101	9-885-062-94	TUNER,KST-MJ104MMV1-60L (EXCEPT 150R)	
PN101	9-885-062-98	TUNER,KST-MJ001MV0-60L (150R)	
		< WIRE ASSEMBLY >	
PWS01	9-885-055-72	WIRE ASSEMBLY, 10PIN 70mm	
		< TRANSISTOR >	
Q401	8-729-902-07	TRANSISTOR 2SA1037K-Q	
Q402	8-729-048-50	TRANSISTOR 2SK3018	
Q403	8-729-048-50	TRANSISTOR 2SK3018	
Q404	8-729-902-07	TRANSISTOR 2SA1037K-Q	
Q405	8-729-902-07	TRANSISTOR 2SA1037K-Q	
Q406	8-729-034-51	TRANSISTOR KTC3875S-GR-T1	
Q407	8-729-038-68	TRANSISTOR KRC103S-T1	
Q408	8-729-038-68	TRANSISTOR KRC103S-T1	
Q410	8-729-902-07	TRANSISTOR 2SA1037K-Q	
Q411	8-729-038-68	TRANSISTOR KRC103S-T1	
Q501	8-729-034-51	TRANSISTOR KTC3875S-GR-T1	
Q605	8-729-038-55	TRANSISTOR KRA103S-T1	
Q606	8-729-038-55	TRANSISTOR KRA103S-T1	
Q607	8-729-034-51	TRANSISTOR KTC3875S-GR-T1	
Q608	8-729-034-51	TRANSISTOR KTC3875S-GR-T1	
Q615	9-885-039-69	TRANSISTOR 2SA1037K-Q	
		< VIBRATOR >	
X101	9-885-054-89	VIBRATOR CRYSTAL 9.8304MHz	
X201	9-885-055-90	VIBRATOR CRYSTAL 12.288MHz	
X501	9-885-040-11	VIBRATOR CRYSTAL 27MHz	
		< ZENER DIODE >	
ZD635	9-885-055-73	DIODE ZENER BZX84-C3V3	
ZD636	9-885-055-73	DIODE ZENER BZX84-C3V3	
ZD637	9-885-055-73	DIODE ZENER BZX84-C3V3	
ZD638	9-885-055-73	DIODE ZENER BZX84-C3V3	
**********			
	9-885-055-49	KEY BOARD,COMPLETE	
		**********	
		< CONNECTOR >	
PS603	1-816-677-11	CONNECTOR,BOARD TO BOARD 8PIN	
		< SWITCH >	
SW631	1-572-184-21	SWITCH,TACT (I/⏻)	
SW632	1-572-184-21	SWITCH,TACT (TUNER FM/AM)	
SW633	1-572-184-21	SWITCH,TACT (INPUT SELECT)	
SW636	1-572-184-21	SWITCH,TACT (CH/PRESET -)	
SW637	1-572-184-21	SWITCH,TACT (CH/PRESET +)	
**********			
	9-885-062-67	SMPS BOARD,COMPLETE	
		**********	
		< CAPACITOR >	
⚠C103	9-885-062-93	CAP, ELECT 330UF 450V	

Ref. No.	Part No.	Description	Remark
		< DIODE >	
⚠BD101	9-885-055-54	DIODE GBU6J	
⚠D102	8-719-085-16	DIODE EU01W	
⚠D103	8-719-991-34	DIODE 1SS133	
⚠D104	6-500-366-01	DIODE ERA22-10	
⚠D105	8-719-085-16	DIODE EU01W	
⚠D108	8-719-085-16	DIODE EU01W	
D122	9-885-055-56	DIODE F20U20STU	
D123	8-719-085-16	DIODE EU01W	
D124	8-719-085-16	DIODE EU01W	
D125	8-719-085-16	DIODE EU01W	
D126	9-885-055-56	DIODE F20U20STU	
D127	8-719-068-69	DIODE FMB-G24H	
D129	8-719-068-69	DIODE FMB-G24H	
		< FUSE >	
⚠F101	1-533-470-12	FUSE SLOW BLOW 3150mA 250V	
		<IC >	
⚠F102	1-532-685-91	IC ICP-N20	
⚠IC101	9-885-055-57	IC KA5Q1565RF	
⚠IC102	8-749-018-95	SENSOR, LTV-817B	
IC103	6-700-522-01	IC KIA431	
⚠IC104	9-885-055-58	IC FS6M07652RTC	
⚠IC105	8-749-018-95	SENSOR, LTV-817B	
IC106	6-700-522-01	IC KIA431	
IC152	8-759-457-44	IC KA78R05TSTU	
		<TRANSFORMER >	
⚠T101	9-885-055-59	TRANSFORMER EER424220	
⚠T102	9-885-055-60	TRANSFORMER EER3530	
		< THERMISTOR >	
⚠TH01	9-885-055-61	THERMISTOR, 4.0OHM	
		< VARISTOR >	
⚠V101	9-885-035-07	VARISTOR, SVC681D	
		< ZENER DIODE >	
⚠ZD101	9-885-055-62	DIODE ZENER UZ-4.7BSB	
⚠ZD102	9-885-055-63	DIODE ZENER UZ-10BSB	
⚠ZD103	9-885-055-63	DIODE ZENER UZ-10BSB	
ZD121	9-885-055-64	DIODE ZENER UZ-3.3BSB	
**********			
	9-885-062-69	VCR BOARD,COMPLETE (150B)	
	9-885-062-75	VCR BOARD,COMPLETE (150E(AEP))	
	9-885-062-77	VCR BOARD,COMPLETE (150E(AED))	
	9-885-062-83	VCR BOARD,COMPLETE (150G)	
	9-885-062-87	VCR BOARD,COMPLETE (150N)	
	9-885-062-92	VCR BOARD,COMPLETE (150R)	
		**********	
		< SWITCH >	
CS501	9-885-055-77	SWITCH,PUSH	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

VCR

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D161	6-500-323-01	DIODE, RL104 R	
D163	6-500-323-01	DIODE, RL104 R	
D165	8-719-991-34	DIODE, 1SS133	
D509	8-719-991-34	DIODE, 1SS133	
D802	8-719-991-34	DIODE, 1SS133	
		< HOLDER >	
ES501	9-885-055-78	HOLDER ASSEMBLY	
ES502	9-885-055-78	HOLDER ASSEMBLY	
		< COIL >	
FL301	9-885-055-79	COIL, 75M	
		< IC >	
IC160	8-759-544-12	IC, KA78R08TSTU	
IC161	8-759-544-11	IC, KA78R33TSTU	
IC162	8-759-544-11	IC, KA78R33TSTU	
IC301	9-885-063-07	IC, LA71750BM	
IC501	9-885-063-00	IC, HD6432197SA HITACHI 112QFP	
IC503	9-885-035-06	IC, AT24C16	
IC504	9-885-032-96	IC, KIA7031P	
IC505	8-759-059-14	IC, KIA7042P	
IC506	8-759-674-43	IC, MM74HCT244SJ	
IC751	9-885-063-08	IC, MSP3417G-QG-B8-V3 NICAM+A2	
IC801	9-885-033-01	IC, TDA9605H QFP44 BK HIFI AMP+HIF	
IC802	9-885-063-09	IC, MM1443XJBE CANAL SWITCH	
		< HOLDER >	
LD501	9-885-035-43	HOLDER ASSEMBLY	
		< SWITCH >	
MS501	9-885-040-19	SWITCH,MODE	
		< CONNECTOR >	
P3D01	9-885-055-92	CONNECTOR,9PIN 1.25mm	
P3D02	9-885-055-93	CONNECTOR,6PIN 2mm	
P3D03	9-885-055-94	CONNECTOR,2PIN	
PM601	9-885-055-95	CONNECTOR,12PIN 2.0mm	
PM602	9-885-055-96	CONNECTOR,7PIN 2.0mm	
PMC01	9-885-055-91	CONNECTOR,BOARD TO BOARD 12PIN	
PMD01	9-885-054-96	CONNECTOR,12P	
PMD02	9-885-054-96	CONNECTOR,12P	
PMD03	9-885-055-90	CONNECTOR ASSEMBLY,12PIN 200mm	
		<TRANSISTOR >	
Q161	8-729-043-89	TRANSISTOR, KTC3205-TP-Y	
Q162	8-729-043-89	TRANSISTOR, KTC3205-TP-Y	
Q163	8-729-034-50	TRANSISTOR, KTA1504-GR-T1	
Q164	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q166	8-729-043-89	TRANSISTOR, KTC3205-TP-Y	
Q167	8-729-040-76	TRANSISTOR, KTA1273-TP-Y	
Q168	8-729-040-76	TRANSISTOR, KTA1273-TP-Y	
Q169	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q301	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q302	8-729-034-50	TRANSISTOR, KTA1504-GR-T1	
Q303	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q304	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q305	8-729-034-50	TRANSISTOR, KTA1504-GR-T1	
Q306	9-885-033-28	TRANSISTOR, 2SC5344Y	
Q308	8-729-034-50	TRANSISTOR, KTA1504-GR-T1	
Q309	8-729-034-50	TRANSISTOR, KTA1504-GR-T1	
Q310	8-729-038-68	TRANSISTOR, KRC103S-T1	
Q501	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q502	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q503	8-729-040-76	TRANSISTOR, KTA1273-TP-Y	
Q504	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q514	8-729-038-68	TRANSISTOR, KRC103S-T1	
Q515	8-729-038-68	TRANSISTOR, KRC103S-T1	
Q5S1	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q804	8-729-034-50	TRANSISTOR, KTA1504-GR-T1	
Q904	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q905	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
Q906	8-729-034-51	TRANSISTOR, KTC3875S-GR-T1	
		< SENSOR >	
RS501	9-885-033-37	SENSOR, SG-260	
RS502	9-885-033-37	SENSOR, SG-260	
		< JACK >	
SC901	9-885-063-03	JACK,SCART(EURO AV1/AV2)	(EXCEPT 150E(AED)/150G/150R)
SC901	9-885-063-05	JACK,SCART (EURO AV1)	(150E(AED)/150G/150R)
		< TUNER >	
TU701	9-885-063-02	TUNER,TADC-M401D (150B)	
TU701	9-885-063-04	TUNER,TADC-M401D (EXCEPT 150B)	
		< VIBRATOR >	
X301	9-885-033-42	VIBRATOR,CRYSTAL4.433709MHz	
X501	9-885-033-43	VIBRATOR,CRYSTAL 10.0MHz	
X502	9-885-063-01	VIBRATOR,CRYSTAL 32.768kHz	
		< ZENER DIODE >	
ZD161	8-719-921-47	DIODE,ZENER MTZJ-5.6B	
ZD162	8-719-921-88	DIODE,ZENER MTZJ-13B	
ZD163	8-719-921-75	DIODE,ZENER MTZJ-10B	
**********			
		MISCELLANEOUS	
		**********	
57	9-885-055-44	FFC,12CORE 1.25 60mm SHIELD	
⚠58	9-885-062-81	CORD, POWER (150G)	
⚠58	9-885-062-66	CORD, POWER (EXCEPT 150G)	
201	9-885-034-65	DRUM ASSY, D35-6CH PAL	
212	9-885-033-93	HEAD, D35 FE ST	
212	9-885-040-18	HEAD (CIRC), D35 FE TDK 6	
223	9-885-040-06	MOTOR ASSY (LOADING)	
231	9-885-056-10	CABLE, FLAT (7 CORE)	
258	9-885-056-12	MOTOR, CAPSTAN	

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REVISION HISTORY

Clicking the version allows you to jump to the revised page.
Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

Ver.	Date	Description of Revision
1.0	2004.06	New